H3/V3 Series

Horizontal and Vertical
Indoor Air Handling Units

Engineering Catalog

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(ACP 30585)

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Model Options | Unit Feature Options

GEN	SIZE	ORENT	MJREV	VLT	CORR	A1	A2	A3	A4	B1	B2	B3	1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
V3	- B	R	B	- 3	- 0	- 1	6	1	C	- 0	**0**	**0**	**:AB**	C	A	- F	G	L	- 0	0	0	- 0	A	0	-	0	0	A	A	0	B	A	-			0	0	-	0	A	N	0	B	B	0	0	0

MODEL OPTIONS

Series and Generation
H3 = Horizontal - Back Intake, Front Discharge
V3 = Vertical - Back Intake, Top Discharge

Unit Size
A = Up to 1,200 cfm
B = Up to 2,000 cfm
C = Up to 4,000 cfm
D = Up to 6,000 cfm
E = Up to 10,000 cfm

Unit Orientation
R = Right Hand Connections
L = Left Hand Connections

Revision
B = Second Revision

Voltage
1 = 230V/1Φ/60Hz
2 = 230V/3Φ/60Hz
3 = 460V/3Φ/60Hz
4 = 575V/3Φ/60Hz
8 = 208V/3Φ/60Hz
9 = 208V/1Φ/60Hz

Corrosion Protection
0 = None
A = Interior Corrosion Protection

A1: Cooling Type
0 = No Cooling
1 = R-410A DX Cooling
2 = Chilled Water Cooling
4 = R-454B DX Cooling

A2: Cooling Rows
0 = No Cooling
4 = 4 Row Coil
6 = 6 Row Coil
8 = 8 Row Coil

A3: Cooling Stages
0 = No Cooling
1 = Single Circuit
2 = Two Circuits - Interlaced Coil D = Double Serpentine
F = Single Serpentine H = Half Serpentine
Q = Quarter Serpentine

A4: Cooling FPI
0 = No Cooling
A = 10 fpi
B = 8 fpi
C = 12 fpi
D = 14 fpi

B1: Heating Type
0 = No Heating
1 = Hot Water
4 = Steam Distributing
6 = Hot Water (Reheat position)
7 = Electric Heat (UL 60335-2-40 Compliant)
A = Open Combustion Natural Gas Heat
B = Separated Combustion Natural Gas Heat
C = Open Combustion LP Gas Heat
D = Separated Combustion LP Gas Heat
E = Open Combustion Natural Gas Heat - High Altitude
F = Separated Combustion Natural Gas Heat - High Altitude
G = Open Combustion LP Gas Heat - High Altitude
H = Separated Combustion LP Gas Heat - High Altitude

Note: Gas Heat Options A – H available only on H3 B, C, and D cabinet sizes

H3/V3 Series Feature String Nomenclature

Model Options : Unit Feature Options

GEN	SIZE	ORENT	MJREV	VLT	CORR	A1	A2	A3	A4	B1	B2	B3	1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
V3	- B	R	B	- 3	- 0	- 1	6	1	C	- 0	**0**	**0**	**:AB**	C	A	-	F	G	L	- 0	0	0	- 0	A	0	-	0	0	-	A	A	0	B	A	-	0	0	-	0	A	N	0	B	B	0	0	0

B2: Heating Designation
0 = No Heating
1 = 1 Row Coil
2 = 2 Row Coil
A = 7 kW (5.3 kW @ 208V)
B = 14 kW (10.5 kW @ 208V)
C = 21 kW (15.8 kW @ 208V)
D = 28 kW (21.0 kW @ 208V)
E = 35 kW (26.3 kW @ 208V)
F = 42 kW (31.5 kW @ 208V)
G = 49 kW (37.0 kW @ 208V) OR 90MBH input
H = 56 kW (42.0 kW @ 208V)
J = 63 kW (47.3 kW @ 208V)
K = 70 kW (52.5 kW @ 208V) OR 135MBH input
M = 84 kW (63.0 kW @ 208V) OR 180MBH input
N = 7.5 kW (5.6 kW @ 208V) OR 225MBH input

B3: Heating Stages
0 = No Heating
1 = 1 Stage
2 = 2 Stage
3 = 3 Stage
4 = 4 Stage
5 = 5 Stage
6 = 6 Stage
B = Modulating 5:1 93% Efficient
S = Modulating/SCR Electric
F = Single Serpentine 12 fpi
H = Half Serpentine 12 fpi
Q = Quarter Serpentine 12 fpi
K = Single Serpentine 8 fpi
L = Half Serpentine 8 fpi
M = Quarter Serpentine 8 fpi
N = Single Serpentine 10 fpi
P = Half Serpentine 10 fpi
R = Quarter Serpentine 10 fpi

1A: Supply Air Blower Configuration
A = 1 Blower + 1 High Efficiency EC Motor
B = 2 Blowers + 2 High Efficiency EC Motors
C = Option A + Piezo Ring
D = Option B + Piezo Rings
E = 1 Blower + 1 Perm Magnet AC TEFC Motor+ 1 VFD
F = 2 Blowers + 2 Perm Magnet AC TEFC Motors + 2 VFDs

1B: Supply Air Blower Model
A = 310 mm Direct Drive BC Plenum Fan
B = 355 mm Direct Drive BC Plenum Fan
C = 450 mm Direct Drive BC Plenum Fan
D = 250 mm Direct Drive BC Plenum Fan
E = 13.5" Backward Curved Plenum, 50% Width
F = 13.5" Backward Curved Plenum, 70% Width
G = 15" Backward Curved Plenum, 70% Width
H = 22" Backward Curved Plenum, 70% Width
1 = 15" Backward Curved Plenum
2 = 15" Backward Curved Plenum, 50% Width
3 = 18.5" Backward Curved Plenum
4 = 18.5" Backward Curved Plenum, 70% Width

H3/V3 Series Feature String Nomenclature

Model Options : Unit Feature Options

GEN	SIZE	ORIENT	MJREV	VLT	CORR	A1	A2	A3	A4	B1	B2	B3	1A	1B	**1C**	**1D**	**2**	**3**	**4**	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
V3	- B	R	B	- 3	- 0	- 1	6	1	C	- 0	0	0	: A	B	**C**	**A**	**-**	**F**	**G**	**L**	- 0	0	0	- 0	A	0	-	0	0	A	A	0	B	A	-	0	0	-	0	A	N	0	B	B	0	0	0

UNIT FEATURE OPTIONS

1C: Supply Air Blower Motor

C = 1.7 kW (2.28 hp)
D = 3.0 kW (4.02 hp)
E = 6.0 kW (8.04 hp)
F = 0.8 kW (1.07 hp)
1 = 1 hp
2 = 2 hp
3 = 3 hp
4 = 5 hp

1D: Supply Air Blower Control / Control Vendor

C = Field Installed Controls by Others
D= Field Installed Controls by Others + Isolation Relays
E = VCCX2 Orion Controls System

2: Refrigeration Options

0 = Standard - None
A = Single Circuit External Hot Gas Bypass
B = Dual Circuit External Hot Gas Bypass
C = Heat Pump
D = Option B + H
F = Options C + H
H = Modulating Hot Gas Reheat
P = Option H (Circuit 1) + Option A (Circuit 2)
R = Option C + A
S = Option C + B
T = Option C + H + A
U = Option C + H + B

3: Special Controls

0 = Standard - None
A = Constant Volume Controller - CV Cool + CV Heat
C = VAV Controller - VAV Cool + CV Heat
E = Make Up Air Controller - CV Cool + CV Heat

4: Additional Controls

0 = Standard - None
A = Phase and Brownout Protection
B = Return and Supply Air Firestat
C = Return Air Smoke Detector

4: Additional Controls (continued)

D = Options A + B
E = Options A + C
F = Options B + C
G = Options A + B + C
H = Remote Safety Shutdown Terminals
J = Energy Recovery Wheel Rotation Detection
K = Options A + H
L = Options A + J
M = Options B + H
N = Options B + J
P = Options C + H
Q = Options C + J
R = Options H + J
S = Options A + B + H
T = Options A + B + J
U = Options A + C + H
V = Options A + C + J
W = Options A + H + J
Y = Options B + C + H
Z = Options B + C + J
1 = Options B + H + J
2 = Options C + H + J
3 = Options A + B + C + H
4 = Options A + B + C + J
5 = Options A + B + H + J
6 = Options A + C + H + J
7 = Options B + C + H + J
8 = Options A + B + C + H + J

H3/V3 Series Feature String Nomenclature

Model Options : Unit Feature Options

GEN	SIZE	ORIENT	MJREV	VLT	CORR	A1	A2	A3	A4	B1	B2	B3	1A	1B	1C	1D	2	3	4	**5A**	**5B**	**5C**	**6A**	**6B**	**6C**	**7**	**8**	**9**	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
V3	- B	R	B	- 3	- 0	- 1	6	1	C	- 0	0	0	: A	B	C	A	- F	G	L	- **0**	**0**	**0**	- **0**	**A**	**0**	- **0**	**0**	**A**	A	0	B	A	-	0	0	-	0	A	N	0	B	B	0	0	0

5A: Return Air Damper Position
0 = Standard - None
F = Front
L = Left Hand (Front OA Damper Required)
R = Right Hand (Front OA Damper Required)
T = Top (Front OA Damper Required)

5B: Outside Air Damper Position
0 = Standard - None
F = Front
L = Left Hand (Front RA Damper Required)
R = Right Hand (Front RA Damper Required)
T = Top (Front RA Damper Required)

5C: Mixing Box Damper Control
0 = Standard - None
A = 2 Position Actuators (24V)
B = Fully Modulating Actuators (DDC)
C = Fixed Position Dampers
D = Fully Modulating Actuator - Enthalpy Limit
E = Fully Modulating Actuator - Sensible Limit

6A: Pre Filter Box
0 = Standard - None
A = 2" Pleated - MERV 8
B = 4" Pleated - MERV 8
C = 4" Pleated - MERV 11
D = 4" Pleated - MERV 13
E = 4" Pleated - MERV 14
F = 2" Pleated - MERV 8 + 4" Pleated - MERV 8
G = 2" Pleated - MERV 8 + 4" Pleated - MERV 11
H = 2" Pleated - MERV 8 + 4" Pleated - MERV 13
J = 2" Pleated - MERV 8 + 4" Pleated - MERV 14

6B: Unit Filter
0 = Standard - None
A = 2" Pleated - MERV 8
B = 4" Pleated - MERV 8
C = 4" Pleated - MERV 11
D = 4" Pleated - MERV 13
E = 4" Pleated - MERV 14
F = 2" Pleated - MERV 8 + 4" Pleated - MERV 8
G = 2" Pleated - MERV 8 + 4" Pleated - MERV 11

6B: Unit Filter (Continued)
H = 2" Pleated - MERV 8 + 4" Pleated - MERV 13
J = 2" Pleated - MERV 8 + 4" Pleated - MERV 14

6C: Final Filter Box
0 = Standard - None
A = 2" Pleated – 30% Eff.
B = 12" Cartridge - MERV 11
C = 12" Cartridge - MERV 13
D = 12" Cartridge - MERV 14
E = 2" Pleated - MERV 8 + 12" Cartridge - MERV11
F = 2" Pleated - MERV 8 + 12" Cartridge - MERV13
G = 2" Pleated - MERV 8 + 12" Cartridge -MERV14
H = 4" Pleated - 30% Eff.

7: Filter Options
0 = Standard - None
A = Magnehelic Gauge
B = Clogged Filter Switch
C = Options A + B
D = Magnehelic Gauge – Unit Filter + ERW Filter
F = Clogged Filter Switch – Unit Filter + ERW Filter
G = Options D + F

8: Coil Coating
0 = Standard - None
A = E-coated Coils
B = Copper Finned Coils + Stainless Steel Coil Casing
D = Aluminum Finned Coils + Stainless Steel Coil Casing
E = E-coated Cooling + Heating Coils + Stainless Steel Coil Casing

9: Expansion Valve
0 = None
A = Thermal Expansion Valves

H3/V3 Series Feature String Nomenclature

Model Options : Unit Feature Options

GEN	SIZE	ORENT	MJREV	VLT	CORR	A1	A2	A3	A4	B1	B2	B3	1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	**10**	**11**	**12**	**13**	**14A**	**14B**	**15**	**16**	17	18	19	20	21	22	23
V3	B	R	B	3	0	1	6	1	C	0	0	0	A	B	C	A	F	G	L	0	0	0	0	A	0	0	A	**A**	**0**	**B**	**A**	**0**	**0**	**0**	**A**	N	0	B	B	0	0	0

10: Expansion Valve Control
0 = None
A = Standard Control

11: External Paint
0 = Standard - None
A = AAON Gray Paint
B = Special Paint

12: Tonnage
0 = Standard - None
A = 2 ton Capacity
B = 3 ton Capacity
C = 4 ton Capacity
D = 5 ton Capacity
E = 6 ton Capacity
F = 7 ton Capacity
G = 8 ton Capacity
U = 9 ton Capacity
H = 10 ton Capacity
V = 11 ton Capacity
W = 13 ton Capacity
J = 14 ton Capacity
Y = 15 ton Capacity
Z = 16 ton Capacity
K = 17 ton Capacity
1 = 18 ton Capacity
2 = 20 ton Capacity
L = 22 ton Capacity
M = 25 ton Capacity
3 = 26 ton Capacity
N = 30 ton Capacity
P = 31 ton Capacity
Q = 34 ton Capacity
R = 40-45 ton Capacity
S = 50-55 ton Capacity
4 = 60 ton Capacity
T = 63 ton Capacity
5 = 70 ton Capacity

13: Energy Recovery Type
0 = Standard – None
A = Energy Recovery Wheel – Total + High CFM, Polymer
C = Energy Recovery Wheel – Total + High CFM, 1% Purge, Polymer
E = Energy Recovery Wheel – Sensible + High CFM, Polymer
G = Energy Recovery Wheel – Sensible + High CFM, 1% Purge, Polymer
J = Energy Recovery Wheel – Total + High CFM, Aluminum
L = Energy Recovery Wheel – Total + High CFM, 1% Purge, Aluminum

14A: Power Options
0 = Standard Power Block

14B: Electrical Rating
0 = Standard
J = 10 kAIC

15: Control Panel
0 = Internal Control Panel
A = Small Control Panel - 16” x 16”
B = Medium Control Panel - 25” x 22”
C = Large Control Panel - 48” x 22”
D = Removable Internal Control Panel (Single Side Access)

16: Shipping Splits
0 = Standard – None
A = 1 Shipping Split (2 pallets)
B = 2 Shipping Splits (3 pallets)
C = 3 Shipping Splits (4 pallets)
D = 4 Shipping Splits (5 pallets)
E = 5 Shipping Splits (6 pallets)
H = Special Shipping Split (SPA Required)

H3/V3 Series Feature String Nomenclature

Unit Options : Unit Feature Options

GEN	SIZE	ORENT	MJREV	VLT	CORR	A1	A2	A3	A4	B1	B2	B3	1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
V3	- B	R	B	- 3	- 0	- 1	6	1	C	- 0	0	0	: A	B	C	A	- F	G	L	- 0	0	0	- 0	A	0	-	0	0	A	A	0	B	A	-	0	0	-	0	A	**N**	**0**	**B**	**B**	**0**	**0**	**0**

17: Energy Recovery Cabinet
0 = Standard – None
A = Top RA + Back EA + Back OA Connections
B = Side RA + Back EA + Back OA Connections
G = OA + EA Dampers – Top RA + Back EA + Back OA Connections
N = OA + Economizer Dampers – Top RA + Back EA + Back Connections
P = OA + Economizer Dampers - Side RA + Back EA + Back OA Connections
U = OA + EA + Economizer Dampers – Top RA + Back EA + Back OA Connections

18: Preheat
0 = Standard - None

19: Exhaust Fan
0 = Standard – None
A = 250 mm Exhaust Fan, 800 W EC Motor
B = 310 mm Exhaust Fan, 1.0 kW EC Motor
C = 310 mm Exhaust Fan, 1.7 kW EC Motor
D = 355 mm Exhaust Fan, 1.7 kW EC Motor
E = 450 mm Exhaust Fan, 3.0 kW EC Motor
F = 450 mm Exhaust Fan, 6.0 kW EC Motor
G = Dual 310 mm Exhaust Fan, 1.0 kW EC Motor
H = Dual 310 mm Exhaust Fan, 1.7 kW EC Motor
J = Dual 355 mm Exhaust Fan, 1.7 kW EC Motor
K = Dual 450 mm Exhaust Fan, 3.0 kW EC Motor
L = Dual 450 mm Exhaust Fan, 6.0 kW EC Motor
M = Option A + Piezo Ring
N = Option B + Piezo Ring
P = Option C + Piezo Ring
Q = Option D + Piezo Ring
R = Option E + Piezo Ring
S = Option F + Piezo Ring
T = Option G + Piezo Ring
U = Option H + Piezo Ring
V = Option J + Piezo Ring
W = Option K + Piezo Ring
Y = Option L + Piezo Ring

20: Crating
0 = Standard – None
A = Export Crating
B = Forkliftable Base – 5” Base
C = Options A + E
D = Options A + B
E = Shipping Shrink Wrap
F = Options B + E
G = Options A + B + E

21: Additional Controls
0 = Standard – None
D = High Condensate Level Switch

22: Warranty
0 = Standard - 1 Year Parts
A = 2 Year Parts Only Warranty (Begins at Date of Shipment)
B = 3 Year Parts Only Warranty (Begins at Date of Shipment)
C = 4 Year Parts Only Warranty (Begins at Date of Shipment)
D = 5 Year Parts Only Warranty (Begins at Date of Shipment)

23: Type
0 = Standard
X = Special Pricing Authorization

Model Number

Unit Size

Example: V3-**B**RB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

The first letter of the model string designates the airflow configuration, the second number designates the generation and the third letter designates the unit size. Refer to AAON ECat for unit dimensions.

Table 1 - Unit Sizes

Model	Cabinet Size	Configuration	RA Location	SA Location	OA Location	EA Location
H3-**A**	Up to 1,200 cfm	Horizontal	Back - Standard Side - ERW	Front	Back - ERW	Back - ERW
H3-**B**	Up to 2,000 cfm					
H3-**C**	Up to 4,000 cfm					
H3-**D**	Up to 6,000 cfm					
H3-**E**	Up to 10,000 cfm					
V3-**A**	Up to 1,200 cfm	Vertical	Back - Standard Top - ERW	Top	Back - ERW	Back - ERW
V3-**B**	Up to 2,000 cfm					
V3-**C**	Up to 4,000 cfm					
V3-**D**	Up to 6,000 cfm					
V3-**E**	Up to 10,000 cfm					

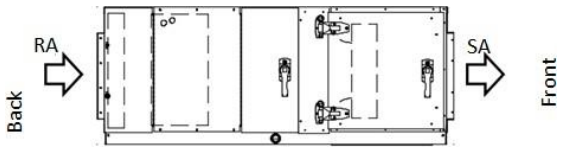


Figure 1 - H3 Series Side View

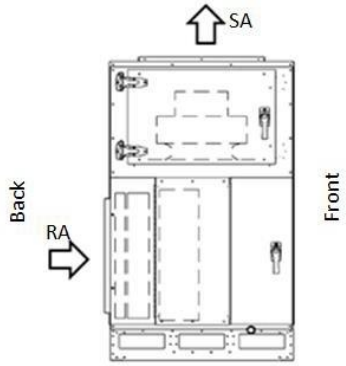


Figure 2 - V3 Series Side View

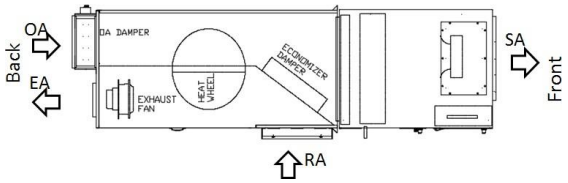


Figure 3 - H3 Series Energy Recovery Top View

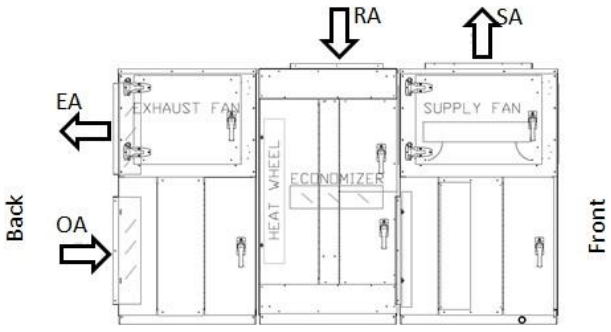


Figure 4 - V3 Series Energy Recovery Side View

Model Number
Unit Orientation

Example: V3-B**R**B-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

R = Right Hand Connections - Refrigerant piping stub outs, hydronic coil stub outs, condensate drain pan connections, and unit access panels are located on the right hand side of the air handling unit.
L = Left Hand Connections - Refrigerant piping stub outs, hydronic coil stub outs, condensate drain pan connections, and unit access panels are located on the left hand side of the air handling unit.

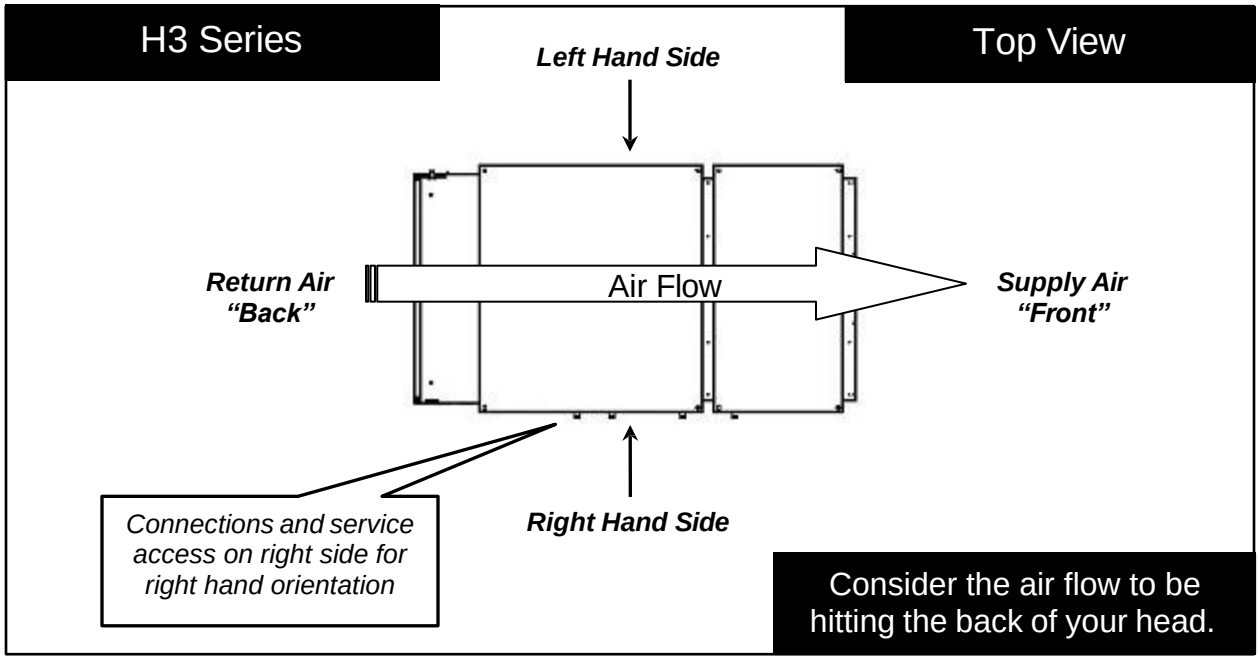


Figure 5 - H3 Series Unit Orientation

Note: Access doors may be on the "left" or "right" side as designated by the unit orientation on the configurator string. "Front" for H3 Series will always be on the supply air discharge side.

Unit Orientation Continued

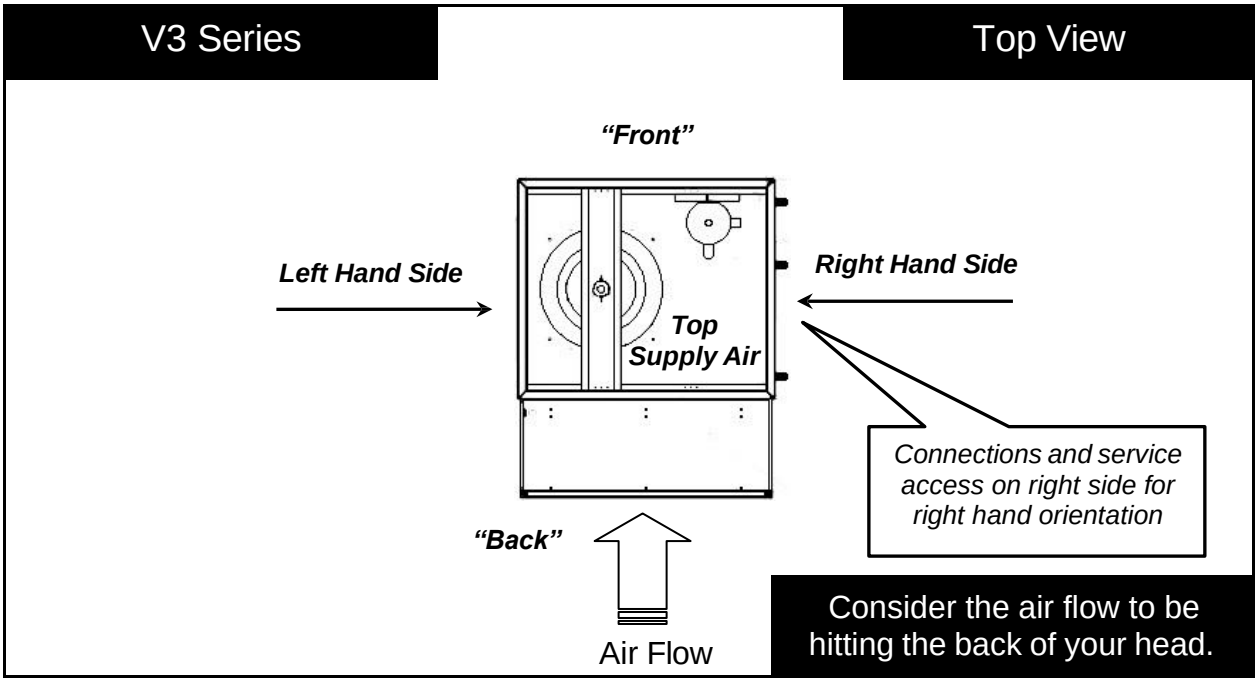


Figure 6 - V3 Series Unit Orientation

Note: Access doors may be on the "left" or "right" side as designated by the unit orientation on the configurator string. "Back" for V3 Series will always be the same side as the pre-filter and entering air opening (return air for standard AHU, outside air for energy recovery wheel unit). "Front" will always be the side opposite the entering air opening.

Model Number

Revision

Example: V3-BR**B**-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

B = *Second Revision* - This digit is used for future product updates and improvements.

Model Number
Voltage

Example: V3-BRB-**3**-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

1 = 230V/1Φ/60Hz
2 = 230V/3Φ/60Hz
3 = 460V/3Φ/60Hz
4 = 575V/3Φ/60Hz
8 = 208V/3Φ/60Hz
9 = 208V/1Φ/60Hz

Model Number
Interior Corrosion Protection

Example: V3-BRB-3-**0**-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *Standard - None*
A = *Interior Corrosion Protection* - Interior ceiling, floor, walls, service doors, damper rack, and filter rack in the air stream are spray coated with a two-part polyurethane, heat baked coating. The coils, coil casings, condensate drain pans, damper blades and gears, fan inlet cone, fan wheel, fan motor, and energy recovery wheel casing are not coated. Option is intended for use in coastal saltwater conditions under the stress of heat, salt, sand and wind and is applicable to all corrosive environments where a polyurethane coating is acceptable. Coating exceeds 2,500 hours when tested under ASTM B 117-95 requirements. See Feature 8 for coil corrosion protection options.

Model Number
Model Option A1 - Cooling Type

Example: V3-BRB-3-0-**1**61C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *No Cooling* - Heating only air handling unit.
1 = *R-410A DX Cooling* - Draw-through R-410A DX evaporator coil of 3/8" OD copper tubes mechanically expanded with sine wave enhanced aluminum fins. DX cooling coil will include a thermal expansion valve and will have sweat type connections. Coils will be hydrogen or helium leak tested to 650psi and marked with a UL sticker. All DX refrigerant coils are factory charged with a nitrogen holding charge.
2 = *Chilled Water Cooling* - Draw-through chilled water coil of 1/2" OD copper tubes mechanically expanded with sine wave enhanced aluminum fins. No valves or valve controls are included with this option. Supply water connection will be the bottom connection of the coil, and

return the top connection. Stub outs will be sweat type connections. Coils will be certified in accordance with AHRI Standard 410 and will be hydrogen or helium leak tested to 250psi and marked with an AHRI sticker and a UL sticker. All water coils are factory charged with a nitrogen holding charge.
4 = *R-454B DX Cooling* - Draw-through R-454B DX evaporator coil of 3/8" OD copper tubes mechanically expanded with sine wave enhanced aluminum fins. DX cooling coil will include a thermal expansion valve and will have sweat type connections. Coils will be hydrogen or helium leak tested to 650psi and marked with a UL sticker. All DX refrigerant coils are factory charged with a nitrogen holding charge.

Model Number
Model Option A2 - Cooling Rows

Example: V3-BRB-3-0-1**6**1C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *No Cooling* - Heating only air handling unit.
4 = *4 Row Coil* - Four row coil.
6 = *6 Row Coil* - Six row coil. High capacity coils improve the unit's energy efficiency and dehumidification capability.
8 = *8 Row Coil* - Eight row coil. Option is only available with chilled water cooling coils.

Model Number
Model Option A3 - Cooling Stages

Example: V3-BRB-3-0-16**1**C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *No Cooling* - Heating only air handling unit.
1 = *Single Circuit* - Single circuited R-410A DX cooling coil with one liquid and suction line connection.

Model Option A3 – Cooling Stages Continued

Example: V3-BRB-3-0-16**1**C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

2 = *Two Circuits - Interlaced Coil* - Dual circuited R-410A DX cooling coil with two liquid and suction line connections. Coil includes interlaced circuitry.
D = *Double Serpentine* - Chilled water coil with double serpentine circuitry. In double serpentine coils, # feeds = 2*(# tubes high). This option gives the lowest water pressure drop and lowest water velocities.
F = *Single Serpentine* - Chilled water coil with single serpentine circuitry. In single serpentine coils, # feeds = # tubes high. Standard chilled water coil circuitry option.

H = *Half Serpentine* - Chilled water coil with half serpentine circuitry. In half serpentine coils, # feeds = (# tubes high) ÷ 2.
Q = *Quarter Serpentine* - Chilled water coil with quarter serpentine circuitry. In quarter serpentine coils, # feeds = (# tubes high) ÷ 4.

Model Number
Model Option A4 - Cooling FPI

Example: V3-BRB-3-0-161**C**-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *No Cooling* - Heating only air handling unit.
A = *10 fpi* - Cooling coil with 10 fins per inch.
B = *8 fpi* - Cooling coil with 8 fins per inch.
C = *12 fpi* - Cooling coil with 12 fins per inch. This is the only fpi option for 6-row DX coils.
D = *14 fpi* - Cooling coil with 14 fins per inch. This option is only available on 4-row DX cooling coil.

Model Number
Model Option B1 - Heating Type

Example: V3-BRB-3-0-161C-**0**00:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *No Heating* - Cooling only air handling unit.
1 = *Hot Water Coil* - Hot water heating coil of 1/2" OD copper tubes mechanically expanded with sine wave enhanced aluminum fins located in the preheat position upstream of the cooling coil. No valves or valve controls are included with this option. Supply water connection will be the bottom connection of the coil, and return the top connection. Stub outs will be sweat type connections. Coils will be certified in accordance with AHRI Standard 410 and will be hydrogen or helium leak tested to 250psi and marked with an AHRI sticker and a UL sticker. All water coils are factory charged with a nitrogen holding charge.
4 = *Steam Distributing Coil* - Steam heating coil of 5/8" OD copper tubes mechanically expanded with sine wave enhanced aluminum fins located in the preheat position upstream of the cooling coil. The maximum steam operating pressure is 25psi. No valves or valve controls are included with this option. Supply steam connection will be the top connection of the coil, and condensate return the bottom connection. Stub outs will be sweat type connections. Coils will be hydrogen or helium leak tested to 250psi and marked with a UL sticker. All steam coils are factory charged with a nitrogen holding charge.
7 = *Electric Heat (UL 60335-2-40 Compliant)* - Electric heater with multiple elements located downstream of the cooling coil and supply fan. This new design uses a removable internal control panel for supply fan access, slide out electric heat strips, and has increased cabinet height compared

to the old style. The design is compliant with UL 60335-2-40 and is ETL certified to the UL1995 standard.

Model Option B1 – Heating Type Continued

Example: V3-BRB-3-0-161C-**0**00:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

6 = *Hot Water Coil (Reheat position)* - Hot water heating coil of 1/2" OD copper tubes mechanically expanded with sine wave enhanced aluminum fins located in the reheat position downstream of the cooling coil. No valves or valve controls are included with this option. Supply water connection will be the bottom connection of the coil, and return the top connection. Stub outs will be sweat type connections. Coils will be certified in accordance with AHRI Standard 410 and will be hydrogen or helium leak tested to 250psi and marked with an AHRI sticker and a UL sticker. All water coils are factory charged with a nitrogen holding charge.

A = *Open Combustion Natural Gas Heat* - Indirect fired high efficiency condensing natural gas heater. Gas heaters include a combustion motor for positive venting of flue exhaust. Field installed venting must be category IV – schedule 40 PVC. Condensate drain system must be field installed. If the heater is located in an outdoor ambient application the drain line must be heat traced to prevent freezing. Gas heaters must be located downstream of the supply fan. This option is only available on H3 Series. Combustion intake configured to pull combustion air from the surrounding space via the following location:

- H3 Series – louvers on the access door.

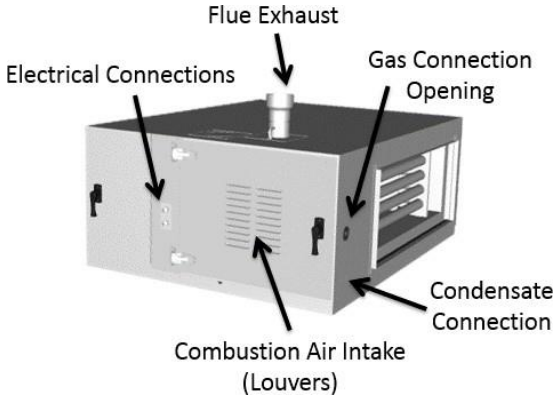


Figure 7 - H3 Gas Heat Open Combustion

B = *Separated Combustion Natural Gas Heat* - Indirect fired high efficiency condensing natural gas heater. Gas heaters include a combustion motor for positive venting of flue exhaust. Field installed venting must be category IV – schedule 40 PVC. Condensate drain system must be field installed. If the heater is located in an outdoor ambient application the drain line must be heat traced to prevent freezing. Gas heaters must be located downstream of the supply fan. This option is only available on H3 Series. Combustion intake configured to pull combustion air from inlet air opening at the following location:

- H3 Series – on the top of the module.

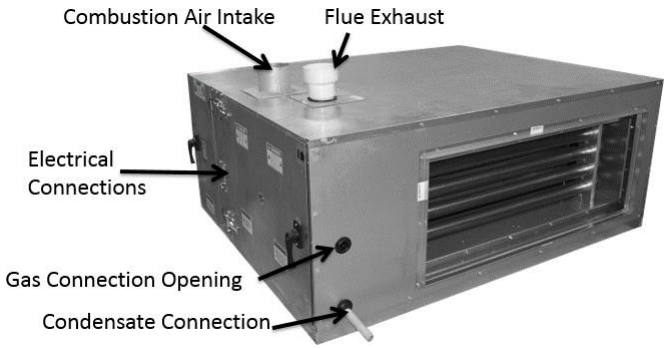


Figure 8 - H3 Gas Heat Separated Combustion

C = *Open Combustion LP Gas Heat* - Same as Option A except LP gas fired instead of natural gas fired. This option is only available on H3 Series.
D = *Separated Combustion LP Gas Heat* - Same as Option B except LP gas fired instead of natural gas fired. This option is only available on H3 Series.
E = *Open Combustion Natural Gas Heat-High Altitude* - Same as Option A except units installed in altitudes above 2000ft must chose this option instead.
F = *Separated Combustion Natural Gas Heat-High Altitude* - Same as Option B except units installed in altitudes above 2000ft must chose this option instead.
G = *Open Combustion LP Gas Heat-High Altitude* - Same as Option C except units installed in altitudes above 2000ft must chose this option instead. This option is only available on H3 Series.
H = *Separated Combustion LP Gas Heat-High Altitude* - Same as Option D except units installed in altitudes above 2000ft must chose this option instead. This option is only available on H3 Series.

Model Number

Model Option B2 - Heating Designation

Example: V3-BRB-3-0-161C-0**0**0:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *No Heating* - Cooling only air handling unit.
1 = *1 Row Coil* - Single row hot water or steam heating coil. No valves or valve controls are included with this option.
2 = *2 Row Coil* - Two row hot water or steam heating coil. No valves or valve controls are included with this option.
A through W = *Heating Capacities* - see Table 2

Table 2 - Heating Capacities

	Electric Heat Capacity		Gas Heat Input Capacity	
	kW (230V, 460V)	kW (208V)	MBH	Unit Size
A = *Heat A*	7.0	5.3		
B = *Heat B*	14.0	10.5		
C = *Heat C*	21.0	15.8		
D = *Heat D*	28.0	21.0		
E = *Heat E*	35.0	26.3		
F = *Heat F*	42.0	31.5		
G = *Heat G*	49.0	37.0	90 MBH	H3-B, C
H = *Heat H*	56.0	42.0		
J = *Heat J*	63.0	47.3		
K = *Heat K*	70.0	52.5	135 MBH	H3-C
L = *Heat L*	77.0	57.8		
M = *Heat M*	84.0	63.0	180 MBH	H3-C, D
N = Heat N	7.5	5.6	225 MBH	H3-C, D

Note: AAON ECat will select the correct heating designation option for electric heat based on the desired leaving air and entering air temperature conditions. For heat pump units this is the emergency or backup heat capacity, which is the capacity of the secondary heater available when heat pump heating is not in use. See General Data section for model specific heating information.

Model Number

Model Option B3 - Heating Stages

Example: V3-BRB-3-0-161C-00**0**:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

0 = *No Heating*
1 = *1 stage* - Single stage heat control.
2 = *2 stage* - Two stage heat control.
3 = *3 stage* - Three stage heat control.
4 = *4 stage* - Four stage heat control.
5 = *5 stage* - Five stage heat control.
6 = *6 stage* – Six stage heat control.

Note: For heat pump units this is the number of emergency or backup heat stages; the number of stages of the emergency electric heat available when heat pump heating is not in use. See General Data section for specific cabinet size heater availability.

B = *Modulating 5:1 93% Efficient* - Option is only available with H3 Series gas heat selections. The gas heater will have a combustion efficiency of 93% with Type 439 stainless steel primary heat exchanger and super ferritic stainless steel alloy recuperative heat exchanger with aluminum fins. Heater gas valve and the speed of the induce draft fan are modulated by a controller allowing a 5:1 turndown for natural gas (3:1 for propane). The maximum temperature rise for the heat exchanger is 100°F and maximum outlet temperature of 140°F. The minimum allowable entering air temperature is negative 40°F. The gas heater has a 10 year prorated warranty.

S = *Modulating/SCR Electric - 0-10VDC Control Signal* - Fully modulating electric heating, controlled by a Silicon Controlled Rectifier (SCR) and DDC controller. A terminal strip to connect a 0-10 VDC control signal by others is included. Units with factory installed controls (Feature 1D=E or H) do not require a terminal strip for SCR since the 0-10VDC control signal comes from the factory installed control board. Heating elements line voltage is modulated linearly with respect to the control signal.
F = *Single Serpentine 12fpi* - Steam heating coil or single serpentine hot water coil with 12 fins per inch. In single serpentine coils, # feeds = # tubes high. Standard hot water and steam heating coil option.
H = *Half Serpentine 12fpi* - Hot water heating coil with half serpentine circuitry and 12 fins per inch. In half serpentine coils, # feeds = (# tubes high) ÷ 2.
Q = *Quarter Serpentine 12fpi* - Hot water heating coil with quarter serpentine circuitry and 12 fins per inch. In quarter serpentine coils, # feeds = (# tubes high) ÷ 4.
K = *Single Serpentine 8fpi* - Steam heating coil or single serpentine hot water coil with 8 fins per inch. In single serpentine coils, # feeds = # tubes high.
L = *Half Serpentine 8fpi* - Hot water heating coil with half serpentine circuitry and 8 fins per inch. In half serpentine coils, # feeds = (# tubes high) ÷ 2.

M = *Quarter Serpentine 8fpi* - Hot water heating coil with quarter serpentine circuitry and 8 fins per inch. In quarter serpentine coils, # feeds = (# tubes high) ÷ 4.
N = *Single Serpentine 10fpi* - Steam heating coil or single serpentine hot water coil with 10 fins per inch. In single serpentine coils, # feeds = # tubes high.
P = *Half Serpentine 10fpi* - Hot water heating coil with half serpentine circuitry and 10 fins per inch. In half serpentine coils, # feeds = (# tubes high) ÷ 2.
R = *Quarter Serpentine 10fpi* - Hot water heating coil with quarter serpentine circuitry and 10 fins per inch. In quarter serpentine coils, # feeds = (# tubes high) ÷ 4.

Feature 1A
Supply Blower Configuration

Example: V3-BRB-3-0-161C-000:**A**BCC-FGL-000-0A0-00AA0BA-00-0AN0BB000

A = *1 Blower with High Efficiency Electronically Commutated Motor (ECM)*
B = *2 Blowers with 2 High Efficiency Electronically Commutated Motors (ECM)*
C = *1 Blower with High Efficiency Electronically Commutated Motor (ECM) + Piezo Ring**
D = *2 Blowers with 2 High Efficiency Electronically Commutated Motors (ECM) + Piezo Rings**
E = *1 Blower + 1 Permanent Magnet AC TEFC Motor + 1 VFD*
F = *2 Blowers + 2 Permanent Magnet AC TEFC Motors + 2 VFDs*

*[C & D] - Piezo Ring feature includes designed holes in the inlet cone, which can be used to determine the supply CFM during operation. Controls must be field provided.

AAON ECat will select the available options for Feature 1A based on unit conditions and the input from the fan selection program. When all of the other features have been selected, you will be prompted to select supply fans under the "Fan Selection" window. In the "Fan Selection" window you will be able to choose the motor based on RPM, efficiency, or sound information. Fan curves will be available for viewing in the "Fan Curve" tab.

Feature 1B
Supply Blower Model

Example: V3-BRB-3-0-161C-000:A**B**CC-FGL-000-0A0-00AA0BA-00-0AN0BB000

A = *310 mm Direct Drive Backward Curved Plenum Fan*
B = *355 mm Direct Drive Backward Curved Plenum Fan*
C = *450 mm Direct Drive Backward Curved Plenum Fan*
D = *250 mm Direct Drive Backward Curved Plenum Fan*
E = *13.5" Direct Drive Backward Curved Plenum Fan, 50% Width*
F = *13.5" Direct Drive Backward Curved Plenum Fan, 70% Width*

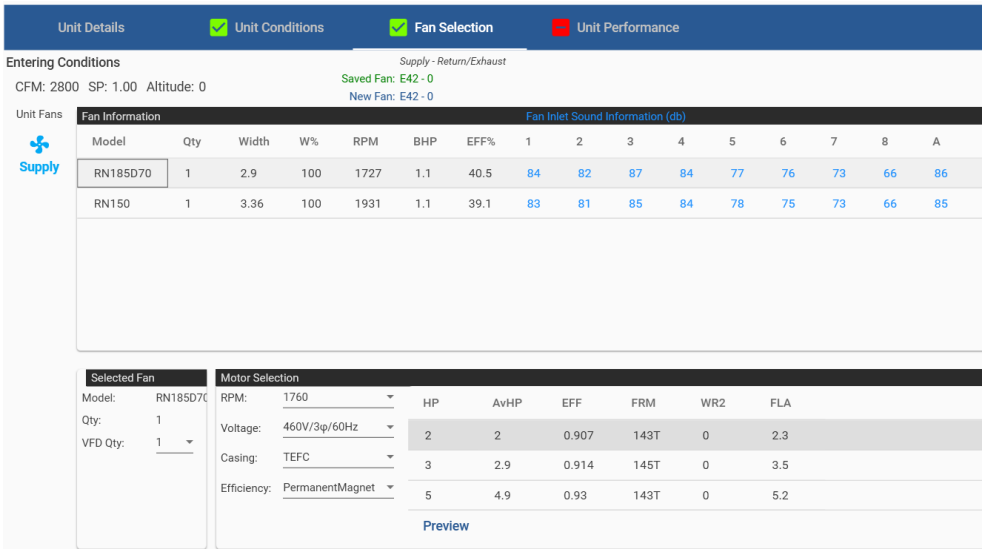
Supply Blower Model (continued)

Example: V3-BRB-3-0-161C-000:A**B**CC-FGL-000-0A0-00AA0BA-00-0AN0BB000

G = *15" Direct Drive Backward Curved Plenum Fan, 70% Width*
H = *22" Direct Drive Backward Curved Plenum Fan, 70% Width*
1 = *15" Direct Drive Backward Curved Plenum Fan*
2 = *15" Direct Drive Backward Curved Plenum Fan, 50% Width*
3 = *18.5" Direct Drive Backward Curved Plenum Fan*
4 = *18.5" Direct Drive Backward Curved Plenum Fan, 70% Width*

Feature 1B – Supply Blower Model Continued

Example: V3-BRB-3-0-161C-000:A**B**CC-FGL-000-0A0-00AA0BA-00-0AN0BB000



AAON ECat will select the available options for Feature 1B based on unit conditions and the input from the fan selection program. When all of the other features have been selected, you will be prompted to select supply fans under the "Fan Selection" window. In the "Fan Selection" window you will be able to choose the motor based on RPM, efficiency, or sound information. Fan curves will be available for viewing in the "Fan Curve" tab.

Feature 1C
Supply Blower Motor

Example: V3-BRB-3-0-161C-000:AB**C**C-FGL-000-0A0-00AA0BA-00-0AN0BB000

C = *1.7 kW (2.28 hp)*	**1** = *1 hp*
D = *3.0 kW (4.02 hp)*	**2** = *2 hp*
E = *6.0 kW (8.00 hp)*	**3** = *3 hp*
F = *0.8 kW (1.07 hp)*	**4** = *5 hp*

Note: High efficiency Electronically Commutated Motors (ECM) are kW rated [options A-F]

The Supply Blower Motor kW (hp) is determined by the VFD model selected. The VFD is mounted in the control cabinet of the unit and wired to the fan.

Feature 1D
Supply Blower Control/Control Vendors

Example: V3-BRB-3-0-161C-000:ABC**C**-FGL-000-0A0-00AA0BA-00-0AN0BB000

C = *Field Installed Controls By Others* - No factory provided unit controller. Low voltage terminal blocks are factory provided and installed for all cooling, heating, and airflow operations. The 0-10VDC signal from the electrically commutated motor (ECM) is jumpered to the terminal block. For variable air flow control, remove the jumper wire and provide a 0-10VDC signal to the GS terminal. For constant air flow, leave the jumper wire in place and use the factory provided and installed supply air cfm setpoint potentiometer. Potentiometer dial uses variable resistance to provide simple setpoint control. The unit includes a factory installed proof of air flow switch that closes when airflow is present. It is wired to a terminal block and labeled PF. Units with electric heat will not include a terminal block for the airflow switch; instead the proof of airflow switch is used as a safety and when no air is detected, the electric heat strips will not enable.

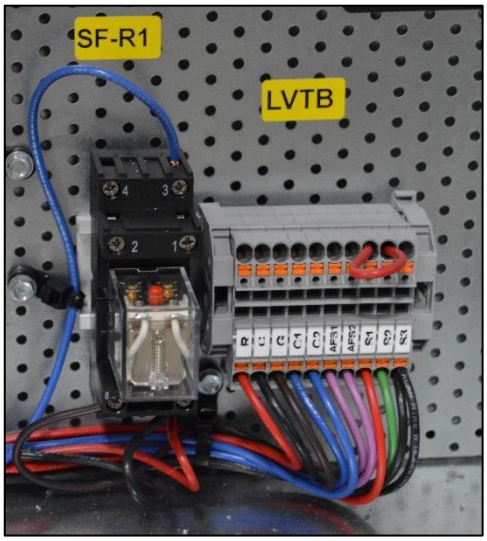


Figure 9 - Terminal Block

D= *Field Installed Controls by Others + Isolation Relays* - No factory provided unit controller. Low voltage terminal blocks are factory provided and installed for all cooling, heating, and airflow operations. The 0-10VDC signal from the electrically commutated motor (ECM) is jumpered to the terminal block. For variable air flow control, remove the jumper wire and provide a 0-10VDC

signal to the GS terminal. For constant air flow, leave the jumper wire in place and use the factory provided and installed supply air cfm setpoint potentiometer. Potentiometer dial uses variable resistance to provide simple setpoint control. The unit includes a factory installed proof of air flow switch that closes when airflow is present. It is wired to a terminal block and labeled PF. Units with electric heat will not include a terminal block for the airflow switch; instead the proof of airflow switch is used as a safety and when no air is detected, the electric heat strips will not enable. **Also included is factory installed isolation relays to prevent voltage drop in the controls circuit. This option is strongly recommended on applications where there is a question about the length of control wiring. Option is available on units with electric heat and gas heat.** Note: In a unit with only a fan, isolation relay is already provided on the fan enable.

E = *VCCX2 Orion Controls System* - AAON provided and factory installed VCCX2 controller. Supply fan speed is controlled by VCCX2 unit controller. The unit includes a factory installed proof of air flow switch wired to a binary input of the board. If the contact opens while the fan is being called to run, all heating and cooling is disabled, and a fan proving alarm is generated. Fan proving must be configured for this alarm to occur. See AAON Controls section for more information. The VCCX2 requires field provided and installed shielded pair between the H3/V3 unit and matching condensing unit for the system to operate. A second optional shielded pair can be field provided and installed to give the capability to program all controllers from one location, either from the H3/V3 unit or the condensing unit whichever is more accessible.

Feature 2
Refrigeration Options

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

0 = *Standard - None* - DX air handling unit includes factory installed expansion valve and liquid and suction line stub outs for connection to a matching condensing unit. Suction and liquid copper lines must be field supplied and installed. Do NOT size the lines based on connection sizes. Expansion valve sensing bulb must be field installed on the suction line. Chilled water coil air handling unit includes supply and return water connection stub outs.

A = *Single Circuit External Hot Gas Bypass* - Factory installed and field adjustable pressure activated bypass valve on one refrigeration circuit factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low air flow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors. When lead circuit includes a variable capacity scroll compressor, this option includes hot gas bypass on the lag circuits.

Hot Gas Bypass on the Lead Stage – Single circuit units include a bypass valve on the only refrigeration circuit (Model Option A3 = 1).

Hot Gas Bypass on the Lag Stage with Lead Stage Variable Capacity Compressor - When lead circuits include variable capacity scroll compressors, this option includes hot gas bypass on the lag circuits. With lead VCC, the dual circuit units include a bypass valve on the second refrigeration circuit (Model Option A3 = 2)

DX air handling unit includes factory installed expansion valve, a check valve on the hot gas bypass line, and liquid, suction and hot gas line stub outs for connection to a matching condensing unit. Suction, liquid, and hot gas bypass copper lines must be field supplied and installed. Do NOT size the lines based on connection sizes. Expansion valve sensing bulb must be field installed on the suction line.

Hot gas bypass valve will be installed in the matching condensing unit.

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

B = *Dual Circuit External Hot Gas Bypass* - Factory installed and field adjustable pressure activated bypass valves on all refrigeration circuits factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low airflow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors.

DX air handling unit includes factory installed expansion valves, check valves on the hot gas bypass lines, and liquid, suction and two hot gas line stub outs for connection to a matching condensing unit. Suction, liquid, and hot gas bypass lead and lag copper lines must be field supplied and installed. Do NOT size the lines based on connection sizes. Expansion valve sensing bulbs must be field installed on the suction lines.

Hot gas bypass valves will be installed in the matching condensing unit. Option is not available when matching condensing unit is selected with variable capacity compressors.

C = *Heat Pump* - Heat pump air handling unit which can provide energy efficient heating and cooling.

DX air handling unit includes factory installed expansion valves with check valve, and liquid and suction line stub outs for connection to a matching heat pump condensing unit. Suction and liquid copper lines must be field supplied and installed. The suction line must be sized based on suction

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

conditions (cooling mode) and discharge conditions (heating mode). Do NOT size the lines based on connection sizes. Expansion valve sensing bulbs must be field installed on the suction lines.

Matching AAON condensing unit includes reversing valve, suction line accumulator, liquid line receiver, outdoor coil filter dryers, and thermal expansion valves with check valves. See Model Options B1, B2 and B3 for emergency (backup) heat options.

D = *Modulating Hot Gas Reheat with Single or Dual Circuit External Hot Gas Bypass* - Refrigerant reheat coil mounted downstream of the evaporator coil with external hot gas bypass on either a single circuit unit with an on/off compressor or a dual circuit unit with two on/off compressors. Reheat coil must be field piped to the lead cooling circuit, to provide the unit with a dehumidification mode of operation for when the cooling load has been satisfied. Factory installed and field adjustable pressure activated bypass valve on all refrigeration circuit(s) factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low air flow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors.

> *Hot Gas Bypass on the Lead Stage* – Single circuit units include a bypass valve on the only refrigeration circuit (Model Option A3 = 1).
>
> *Hot Gas Bypass on the Lead and Lag Stage* - When both circuits include on/off scroll compressors, this option includes hot gas bypass on the both circuits.
> (Model Option A3 = 2)

DX air handling unit includes factory installed expansion valve, check valve on the liquid line, check valve on the hot gas reheat line, check valve on the hot gas bypass line, and liquid, suction, hot gas reheat, and hot gas bypass line stub outs for connection to a matching condensing unit. Suction, liquid, hot gas reheat (on the lead refrigerant circuit), and hot gas bypass (on the lead and lag refrigerant circuits) copper lines must be field supplied and installed. Do NOT size the lines based on connection sizes. Expansion valve sensing bulb must be field installed on the suction line.

Matching AAON condensing unit includes liquid line receiver tank, 3-way modulating hot gas reheat valve, modulating hot gas reheat controller, and hot gas bypass valve(s). Supply air sensor ships in the H3/V3 unit when factory installed controls are selected (Feature 1D = E or H). Supply air sensor ships in the matching AAON condensing unit when field installed controls are selected (Feature 1D = C or D). Hot gas bypass is not available on circuits using variable capacity compressors.

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

F = *Heat Pump with Modulating Hot Gas Reheat* - Option C + H. Heat pump with a refrigerant reheat coil mounted downstream of the evaporator coil. Coil must be field piped to the lead cooling circuit, to provide the unit with a dehumidification mode of operation for when the cooling load has been satisfied.

DX air handling unit includes factory installed expansion valve, check valves on the hot gas reheat line, and liquid, suction, and hot gas reheat line stub outs for connection to a matching condensing unit. Suction, liquid, and hot gas reheat (on the lead refrigerant circuit) copper lines must be field supplied and installed. The suction line must be sized based on suction conditions (cooling mode) and discharge conditions (heating mode). Do NOT size the lines based on connection sizes. Expansion valve sensing bulb must be field installed on the suction line.

Matching AAON condensing unit includes reversing valve, suction line accumulator, liquid line receiver, outdoor coil filter dryers, 3-way modulating hot gas reheat valve, modulating hot gas reheat controller, and thermal expansion valves with check valves. Supply air sensor ships in the H3/V3 unit when factory installed controls are selected (Feature 1D = E or H). Supply air sensor ships in the matching AAON condensing unit when field installed controls are selected (Feature 1D = C or D).

H = *Modulating Hot Gas Reheat* - Refrigerant reheat coil mounted downstream of the evaporator coil. Coil must be field piped to the lead cooling circuit to provide the unit with a dehumidification mode of operation for when the cooling load has been satisfied.

DX air handling unit includes factory installed expansion valve, check valve on the liquid line, check valve on the hot gas reheat line, and liquid, suction and hot gas reheat line stub outs for connection to a matching condensing unit. Suction, liquid, and hot gas reheat (on the lead refrigerant circuit) copper lines must be field supplied and installed. Do NOT size the lines based on connection sizes. Expansion valve sensing bulb must be field installed on the suction line.

Matching AAON condensing unit includes liquid line receiver tank, 3-way modulating hot gas reheat valve, and modulating hot gas reheat controller. Supply air sensor ships in the H3/V3 unit when factory installed controls are selected (Feature 1D = E or H). Supply air sensor ships in the matching AAON condensing unit when field installed controls are selected (Feature 1D = C or D).

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

P = *Modulating Hot Gas Reheat with Circuit 2 External Hot Gas Bypass* – Options A (Circuit 2) + H (Circuit 1). Refrigerant reheat coil mounted downstream of the evaporator coil on refrigeration circuit 1 and hot gas bypass on refrigeration circuit 2. Reheat coil must be field piped to the lead cooling circuit to provide the unit with a dehumidification mode of operation for when the cooling load has been satisfied. Factory installed and field adjustable pressure activated bypass valve on the lead refrigeration circuit factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low air flow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors.

DX air handling unit includes factory installed expansion valve, check valve on the liquid line, check valve on the hot gas reheat line, check valve on the hot gas bypass line, and liquid, suction, hot gas reheat, and hot gas bypass line stub outs for connection to a matching condensing unit. Suction, liquid, hot gas reheat (on the lead refrigerant circuit), and hot gas bypass (on lag refrigerant circuit) copper lines must be field supplied and installed. Do NOT size the lines based on connection sizes. Expansion valve sensing bulb must be field installed on the suction lines.

Matching AAON condensing unit includes liquid line receiver tank, 3-way modulating hot gas reheat valve, modulating hot gas reheat controller, and hot gas bypass valve. This option is only available when the first circuit uses variable capacity scroll compressor and the second is on/off.

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

R = *Heat Pump with Single Circuit External Hot Gas Bypass* - Option C + A - Heat pump air handling unit with external hot gas bypass on either a single circuit unit with an on/off compressor or a dual circuit unit with on/off compressor in the second circuit. Factory installed and field adjustable pressure activated bypass valve on the lead refrigeration circuit factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low air flow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors. When lead circuit includes a variable capacity scroll compressor, this option includes hot gas bypass on the lag circuits.

> *Hot Gas Bypass on the Lead Stage* – Single circuit units include a bypass valve on the only refrigeration circuit (Model Option A3 = 1).
>
> *Hot Gas Bypass on the Lag Stage with Lead Stage Variable Capacity Compressor* - When lead circuits include variable capacity scroll compressors, this option includes hot gas bypass on the lag circuits. With lead VCC, the dual circuit units include a bypass valve on the second refrigeration circuit (Model Option A3 = 2)

DX air handling unit includes factory installed expansion valves with check valve, a check valve on the hot gas bypass line, and liquid, suction, and hot gas bypass line stub outs for connection to a matching heat pump condensing unit. Suction, liquid and hot gas bypass (on lag refrigerant circuit) copper lines must be field supplied and installed. The suction line must be sized based on suction conditions (cooling mode) and discharge conditions (heating mode). Do NOT size the lines based on connection sizes. Expansion valve sensing bulbs must be field installed on the suction lines.

Matching AAON condensing unit includes reversing valve, suction line accumulator, liquid line receiver, outdoor coil filter dryers, hot gas bypass valve, and thermal expansion valves with check valves. See Model Options B1, B2 and B3 for emergency (backup) heat options.

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

S = *Heat Pump with Dual Circuit External Hot Gas Bypass* - Option C + B - Heat pump air handling unit with external hot gas bypass on both circuits. Factory installed and field adjustable pressure activated bypass valve on both refrigeration circuits factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low air flow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors.

DX air handling unit includes factory installed expansion valves with check valve, a check valves on the hot gas bypass lines, and liquid, suction, and two hot gas bypass line stub outs for connection to a matching heat pump condensing unit. Suction, liquid and hot gas bypass (on lead and lag refrigerant circuit) copper lines must be field supplied and installed. The suction line must be sized based on suction conditions (cooling mode) and discharge conditions (heating mode). Do NOT size the lines based on connection sizes. Expansion valve sensing bulbs must be field installed on the suction lines.

Matching AAON condensing unit includes reversing valve, suction line accumulator, liquid line receiver, outdoor coil filter dryers, hot gas bypass valves, and thermal expansion valves with check valves. See Model Options B1, B2 and B3 for emergency (backup) heat options.

T = *Heat Pump with Modulating Hot Gas Reheat and Single Circuit External Hot Gas Bypass* - Option C + H + A - Heat pump with a refrigerant reheat coil mounted downstream of the evaporator coil and external hot gas bypass on either a single circuit unit with an on/off compressor or a dual circuit unit with on/off compressor in the second circuit. Coil must be field piped to the lead cooling circuit to provide the unit with a dehumidification mode of operation for when the cooling load has been satisfied. Factory installed and field adjustable pressure activated bypass valve on the lead refrigeration circuit factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low air flow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. **Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors.** When lead circuit includes a variable capacity scroll compressor, this option includes hot gas bypass on the lag circuit.

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

Hot Gas Bypass on the Lead Stage – Single circuit units include a bypass valve on the only refrigeration circuit (Model Option A3 = 1).

Hot Gas Bypass on the Lag Stage with Lead Stage Variable Capacity Compressor - When lead circuits include variable capacity scroll compressors, this option includes hot gas bypass on the lag circuits. With lead VCC, the dual circuit units include a bypass valve on the second refrigeration circuit (Model Option A3 = 2)

DX air handling unit includes factory installed expansion valves with check valve, a check valve on the hot gas bypass line, a check valve on the hot gas reheat line, and liquid, suction, hot gas reheat, and hot gas bypass line stub outs for connection to a matching condensing unit. Expansion valve sensing bulbs must be field installed on the suction lines. Suction, liquid, hot gas reheat (on lead refrigerant circuit), and hot gas bypass (on lag refrigerant circuit) copper lines must be field supplied and installed. The suction line must be sized based on suction conditions (cooling mode) and discharge conditions (heating mode). Do NOT size the lines based on connection sizes.

Matching AAON condensing unit includes reversing valve, suction line accumulator, liquid line receiver, outdoor coil filter dryers, 3-way modulating hot gas reheat valve, modulating hot gas reheat controller, hot gas bypass valve, and thermal expansion valves with check valves. See Model Options B1, B2 and B3 for emergency (backup) heat options.

U = *Heat Pump with Modulating Hot Gas Reheat and Dual Circuit External Hot Gas Bypass* - Option C + H + B - Heat pump with a refrigerant reheat coil mounted downstream of the evaporator coil and external hot gas bypass on both circuits. Coil must be field piped to the lead cooling circuit to provide the unit with a dehumidification mode of operation for when the cooling load has been satisfied. Factory installed and field adjustable pressure activated bypass valve on both refrigeration circuits factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator side of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option is used to prevent coil freeze-up during periods of low air flow or cold entering coil conditions without cycling of the compressors on and off. This option is used for refrigeration system protection only and cannot be used for cooling capacity modulation. **Hot gas bypass is required on all circuits for Variable Air Volume (VAV) and Makeup Air (MUA) units without variable capacity scroll compressors.**

DX air handling unit includes factory installed expansion valves with check valve, check valves on the hot gas bypass lines, a check valve on the hot gas reheat line, and liquid, suction, hot gas reheat, and hot gas bypass line stub outs for connection to a matching condensing unit. Suction, liquid, hot gas reheat (on lead refrigerant circuit), and hot gas bypass (on lead and lag refrigerant circuit) copper lines must be field supplied and installed. The suction line must be sized based on suction conditions (cooling mode) and discharge conditions (heating mode). Do NOT size the

Feature 2 – Refrigeration Options Continued

Example: V3-BRB-3-0-161C-000:ABCC-**F**GL-000-0A0-00AA0BA-00-0AN0BB000

lines based on connection sizes. Expansion valve sensing bulbs must be field installed on the suction lines.

Matching AAON condensing unit includes reversing valve, suction line accumulator, liquid line receiver, outdoor coil filter dryers, 3-way modulating hot gas reheat valve, modulating hot gas reheat controller, hot gas bypass valves, and thermal expansion valves with check valves. See Model Options B1, B2 and B3 for emergency (backup) heat options.

Feature 3
Special Controls

Example: V3-BRB-3-0-161C-000:ABCC-F**G**L-000-0A0-00AA0BA-00-0AN0BB000

0 = *Standard - None* - Terminal strip for use with a thermostat. See Controls section and Thermostat Terminals sheet from AAON ECat for more information.

A = *Constant Volume Unit Controller - Constant Volume Cooling and Constant Volume Heating* - Standard Constant Volume controls. During the cooling mode of operation the supply fan provides constant airflow and mechanical cooling modulates based on the controlling temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature. Outside air temperature sensor, supply air temperature sensor and space temperature sensor with setpoint reset and unoccupied override are factory supplied for field installation. Units with modulating hot gas reheat will include a space temperature & humidity sensor in place of the space temperature sensor. See Controls section for more information.

C = *Variable Volume Unit Controller - Variable Volume Cooling and Constant Volume Heating* - Standard VAV controls. During the cooling mode of operation the supply fan modulates based on the supply static pressure and mechanical cooling modulates based on the supply air temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature. Outside air temperature sensor, return air temperature, supply air temperature sensor, space temperature sensor with setpoint reset and unoccupied override, and supply air static pressure probe are factory supplied for field installation. See Controls section for more information.

E = *Make Up Air Unit Controller - Constant Volume Cooling and Constant Volume Heating* - Standard Make Up Air controls. During the cooling mode of operation the supply fan provides constant airflow and mechanical cooling modulates based on the controlling temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates

Feature 3 – Special Controls Continued

Example: V3-BRB-3-0-161C-000:ABCC-F**G**L-000-0A0-00AA0BA-00-0AN0BB000

based on the controlling temperature. Outside air temperature sensor and supply air temperature sensor are factory supplied for field installation. Units with modulating hot gas reheat will include an outside air temperature & humidity sensor in place of the outside air temperature sensor. See Controls section for more information.

Feature 4
Additional Controls

Example: V3-BRB-3-0-161C-000:ABCC-FG**L**-000-0A0-00AA0BA-00-0AN0BB000

0 = *Standard - None*
A = *Phase and Brown Out Protection* - Voltage monitor that is used to protect motors and compressors from voltage imbalance, over/under voltage and phase loss. Reset is automatic.
B = *Return and Supply Air Firestats* - Bimetallic snap-action safety switches sensing temperature only, mounted in both the supply and return air streams. The supply air switch is rated to 200°F and the return air switch is rated to 125°F. Both switches manually reset and are wired to shut down the 24 VAC control circuit. Firestats are non-addressable.
C = *Return Air Smoke Detector* - Photoelectric type smoke detector factory provided to be field installed in the return air stream. Detector is wired to shut down the 24 VAC control circuit upon detector activation, thereby shutting off the unit. Relay contacts are provided for interfacing the detector with alarm panels. A test magnet is supplied in the unit controls cabinet. Smoke detectors are non-addressable.
D = *Phase and Brown Out Protection + Return and Supply Air Firestats* - Options A + B
E = *Phase and Brown Out Protection + Return Air Smoke Detector* - Options A + C
F = *Return and Supply Air Firestats + Return Air Smoke Detector* - Options B + C
G = *Phase and Brown Out Protection + Return and Supply Air Firestats + Return Air Smoke Detector* - Options A + B + C
H = *Remote Safety Shutdown Terminals* - Two pole low voltage terminal block for wiring to a field installed smoke detector, Firestat, or building safety automatic shutdown system. When contacts are open, the unit 24 VAC control circuit is broken and the unit will not operate. Remove the factory supplied jumper before installing.
J = *Energy Recovery Wheel (ERW) Rotation Detection* - Wheel rotation sensor and speed switch output module mounted in the energy recovery wheel section. The module contains a normally open and a normally closed set of contacts wired to the low voltage terminal block for field indication of wheel rotation.
K = *Phase and Brown Out Protection + Remote Safety Shutdown Terminals* - Options A + H
L = *Phase and Brown Out Protection + ERW Rotation Detection* - Options A + J
M = *Return and Supply Air Firestats + Remote Safety Shutdown Terminals* - Options B + H
N = *Return and Supply Air Firestats + ERW Rotation Detection* - Options B + J

Feature 4 – Additional Controls Continued

Example: V3-BRB-3-0-161C-000:ABCC-FG**L**-000-0A0-00AA0BA-00-0AN0BB000

P = *Return Air Smoke Detector + Remote Safety Shutdown Terminals* - Options C + H
Q = *Return Air Smoke Detector + ERW Rotation Detection* - Options C + J
R = *Remote Safety Shutdown Terminals + ERW Rotation Detection* - Options H + J
S = *Phase and Brown Out Protection + Return and Supply Air Firestats + Remote Safety Shutdown Terminals* - Options A + B + H
T = *Phase and Brown Out Protection + Return and Supply Air Firestats + ERW Rotation Detection* - Options A + B + J
U = *Phase and Brown Out Protection + Return Air Smoke Detector + Remote Safety Shutdown Terminals* - Options A + C + H

V = *Phase and Brown Out Protection + Return Air Smoke Detector + ERW Rotation Detection* - Options A + C + J
W = *Phase and Brown Out Protection + Remote Safety Shutdown Terminals+ ERW Rotation Detection* - Options A + H + J
Y = *Return and Supply Air Firestats + Return Air Smoke Detector + Remote Safety Shutdown Terminals* - Options B + C + H
Z = *Return and Supply Air Firestats + Return Air Smoke Detector + ERW Rotation Detection* - Options B + C + J
1 = *Return and Supply Air Firestats + Remote Safety Shutdown Terminals + ERW Rotation Detection* - Options B + H + J
2 = *Return Air Smoke Detector + Remote Safety Shutdown Terminals+ ERW Rotation Detection* - Options C + H + J
3 = *Phase and Brown Out Protection + Return and Supply Air Firestats + Return Air Smoke Detector + Remote Safety Shutdown Terminals* - Options A + B + C + H
4 = *Phase and Brown Out Protection + Return and Supply Air Firestats + Return Air Smoke Detector + ERW Rotation Detection* - Options A + B + C + J
5 = *Phase and Brown Out Protection + Return and Supply Air Firestats + Remote Safety Shutdown Terminals + ERW Rotation Detection* - Options A + B + H + J
6 = *Phase and Brown Out Protection + Return Air Smoke Detector + Remote Safety Shutdown Terminals + ERW Rotation Detection* - Options A + C + H + J
7 = *Return and Supply Air Firestats + Return Air Smoke Detector + Remote Safety Shutdown Terminals + ERW Rotation Detection* - Options B + C + H + J
8 = *Phase and Brown Out Protection + Return and Supply Air Firestats + Return Air Smoke Detector + Remote Safety Shutdown Terminals + ERW Rotation Detection* - Options A + B + C + H + J

Feature 5A
Return Air Damper Position

Example: V3-BRB-3-0-161C-000:ABCC-FGL-**0**00-0A0-00AA0BA-00-0AN0BB000

0 = *Standard - None*
F = *Front* - Mixing box with return air damper located on the back of the mixing box. Damper is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. The return air damper opening of the mixing box will be located at the back of the unit using Figure 1 or Figure 2 for unit orientation.

L = *Left Hand - Front Outside Air Damper Required* - Mixing box with return air damper located on the left hand side of the mixing box using Figure 5 or Figure 6 for unit orientation. Damper is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. Outside air damper (Feature 5B) must be located at the back of the unit using Figure 1 or Figure 2 for unit orientation.
R = *Right Hand - Front Outside Air Damper Required* - Mixing box with return air damper located on the right hand side of the mixing box using Figure 5 or Figure 6 for unit orientation. Damper is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. Outside air damper (Feature 5B) must be located at the back of the unit using Figure 1 or Figure 2 for unit orientation.
T = *Top - Front Outside Air Damper Required* - Mixing box with return air damper located on the top of the mixing box. Damper is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. Outside air damper (Feature 5B) must be located at the back of the unit using Figure 1 or Figure 2 for unit orientation.

Feature 5B
Outside Air Damper Position

Example: V3-BRB-3-0-161C-000:ABCC-FGL-0**0**0-0A0-00AA0BA-00-0AN0BB000

0 = *Standard - None*
F = *Front* - Mixing box with outside air damper located on the back of the mixing box. Damper is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. The outside air damper opening of the mixing box will be located at the back of the unit using Figure 1 or Figure 2 for unit orientation.
L = *Left Hand - Front Return Air Damper Required* - Mixing box with outside air damper located on the left hand side of the mixing box using Figure 5 or Figure 6 for unit orientation. Damper is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. Return air damper (Feature 5A) must be located on the back of the unit using Figure 1 or Figure 2 for unit orientation.
R = *Right Hand - Front Return Air Damper Required* - Mixing box with outside air damper located on the right hand side of the mixing box using Figure 5 or Figure 6 for unit orientation. Damper

Feature 5B
Outside Air Damper Position (Continued)

Example: V3-BRB-3-0-161C-000:ABCC-FGL-0**0**0-0A0-00AA0BA-00-0AN0BB000

is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. Return air damper (Feature 5A) must be located on the back of the unit using Figure 1 or Figure 2 for unit orientation.
T = *Top - Front Return Air Damper Required* - Mixing box with outside air damper located on the top of the mixing box. Damper is either manually adjustable fixed position or will include its own independent actuator depending on Feature 5C. Return air damper (Feature 5A) must be located on the back of the unit using Figure 1 or Figure 2 for unit orientation.

Feature 5C
Mixing Box Damper Control

Example: V3-BRB-3-0-161C-000:ABCC-FGL-00**0**-0A0-00AA0BA-00-0AN0BB000

0 = *Standard - None*
A = *2 Position Actuator (24V)* - Two position actuators on the return air and outside air mixing box dampers. Position one is the closed position. Position two is the fully open position (Figure 10 would be set to 1 instead of 0.2 as shown in the picture), which is activated when there is a call for supply fan operation. The actuators are spring return closed. Return air dampers are wired normally open and outside air dampers are wired normally closed.

B = *Fully Modulating Actuator (DDC)* - Fully modulating actuators on the return air and outside air mixing box dampers. Return air dampers are wired normally open and outside air dampers are wired normally closed.

Figure 10 - Mixing Box Actuator

When Feature 1D = AAON Controls (E or H) Position one is the closed position. Position two is the minimum outside air position, which is activated when there is a call for supply fan operation. During the economizer mode the outside air actuator modulates between minimum position and having the outside air dampers fully open to maintain a discharge temperature of 55°F. The minimum outside air position can be field adjusted for the desired amount of outside air. (Figure 10 shows 20% as the minimum outside air position) The actuators are spring return closed.

Feature 5C
Mixing Box Damper Control (Continued)

Example: V3-BRB-3-0-161C-000:ABCC-FGL-00**0**-0A0-00AA0BA-00-0AN0BB000

When Feature 1D = Field Installed Controls by Others (C or D) The actuators are wired to a low voltage terminal block labeled EC for 0-10V control signal. The minimum outside air position can be field adjusted for the desired amount of outside air. The actuators are spring return closed.

C = *Fixed Position Dampers* - Manually adjustable fixed position return air and outside air mixing box dampers. This option does not include actuators.

D = *Fully Modulating Actuator (DDC)- Enthalpy Limit* - Fully modulating actuators on the return air and outside air mixing box dampers. Return air dampers are wired normally open and outside air dampers are wired normally closed. Fully modulating economizer actuator with two positions. Position one is the closed position. Position two is the minimum outside air position, which is activated when there is a call for supply fan operation. During the economizer mode actuator modulates between minimum outside air position and having the outside air dampers fully open to maintain a discharge temperature of 55°F. The minimum outside air position can be field adjusted for the desired amount of outside air. Changeover control responds to sensible and latent heat of the ambient air. The actuator is spring return closed.

E = *Fully Modulating Actuator (DDC)- Sensible Limit* - Fully modulating actuators on the return air and outside air mixing box dampers. Return air dampers are wired normally open and outside air dampers are wired normally closed. Fully modulating economizer actuator with two positions. Position one is the closed position. Position two is the minimum outside air position, which is activated when there is a call for supply fan operation. During the economizer mode actuator modulates between minimum outside air position and having the outside air dampers fully open to maintain a discharge temperature of 55°F. The minimum outside air position can be field adjusted for the desired amount of outside air. The range for the changeover control is 45°F to 95°F and responds to sensible temperature only. The actuator is spring return closed.

The mixing boxes below represent FF mixing boxes. Notice the views below are side views with the exception of V3-A, H3-C, and H3-D&E.

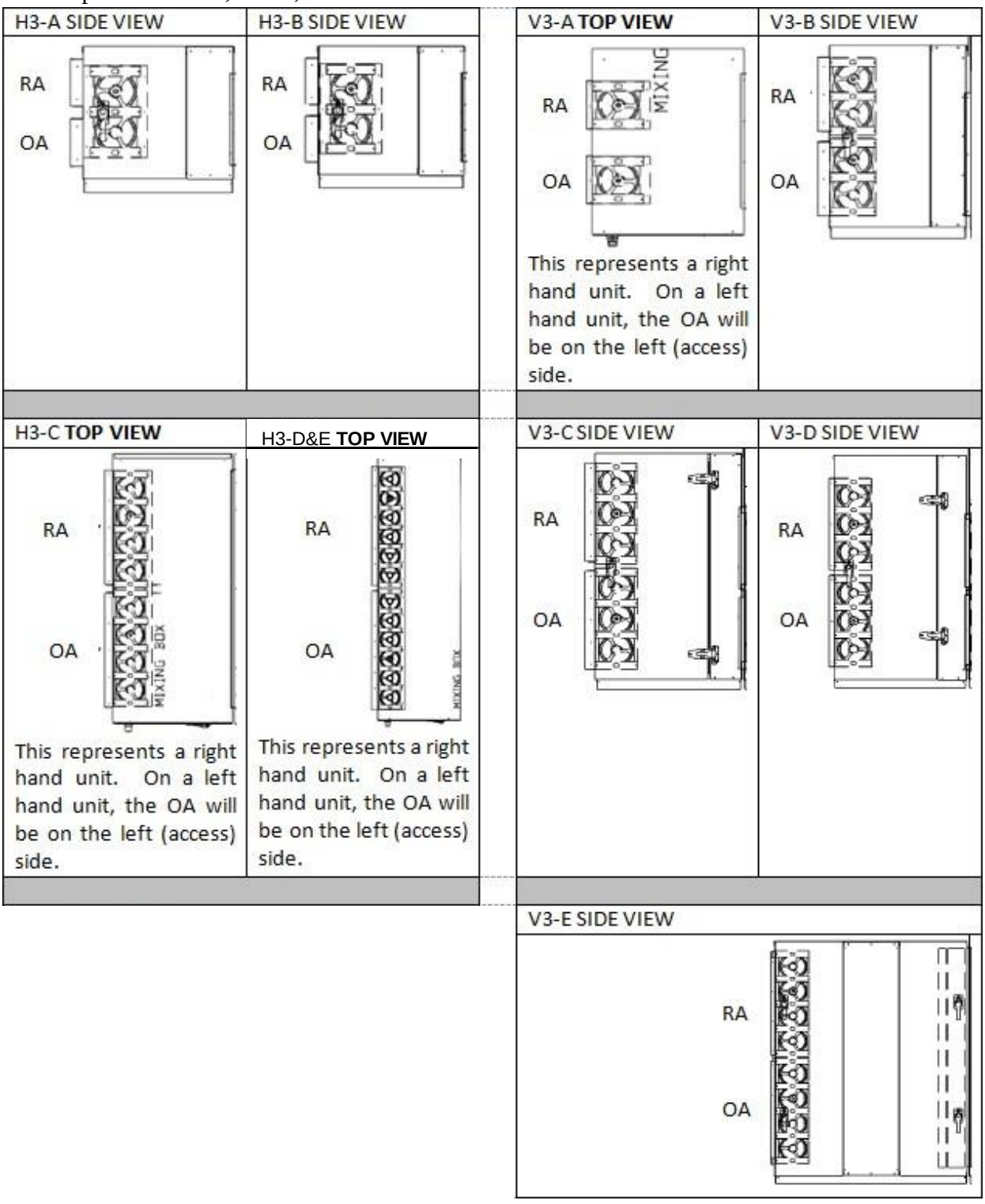


Figure 11 - Front RA, Front OA Mixing Box Arrangements
(Feature 5A = RA = normally open, Feature 5B = OA = normally closed)

The mixing boxes below represent FL mixing boxes. The LF mixing box would be the same physical box, but the RA would enter in the left and the OA would enter at the front. Notice the views below are top views.

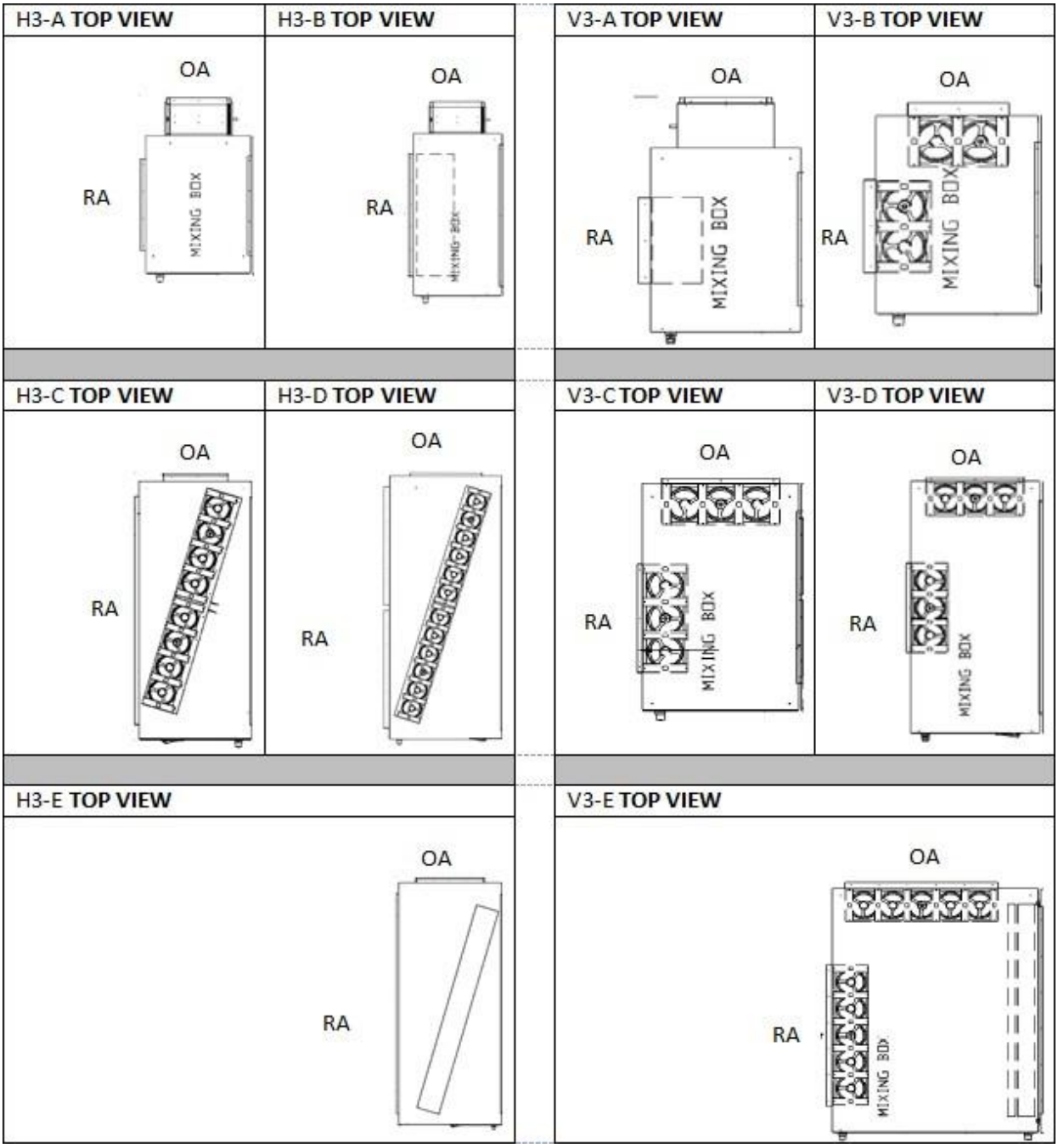


Figure 12 - Front RA, Left OA Mixing Box Arrangements
(Feature 5A = RA = normally open, Feature 5B = OA = normally closed)

The mixing boxes below represent FR mixing boxes. The RF mixing box would be the same physical box, but the RA would enter in the right and the OA would enter at the front. Notice the views below are top views.

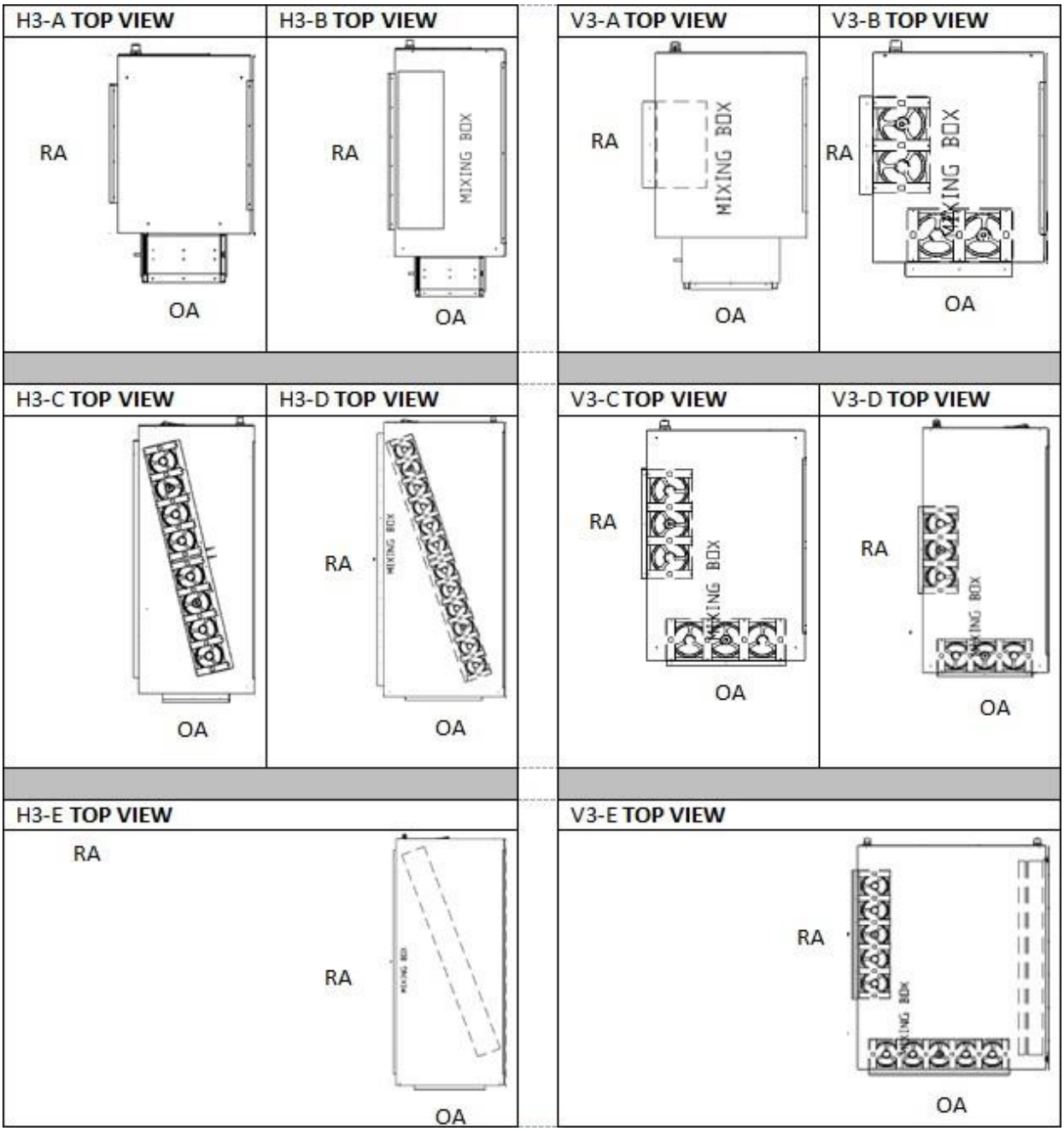


Figure 13 - Front RA, Right OA Mixing Box Arrangements
(Feature 5A = RA = normally open, Feature 5B = OA = normally closed)

The mixing boxes below represent FT mixing boxes. The TF mixing box would be the same physical box, but the RA would enter in the top and the OA would enter at the front. Notice the views below are side views.

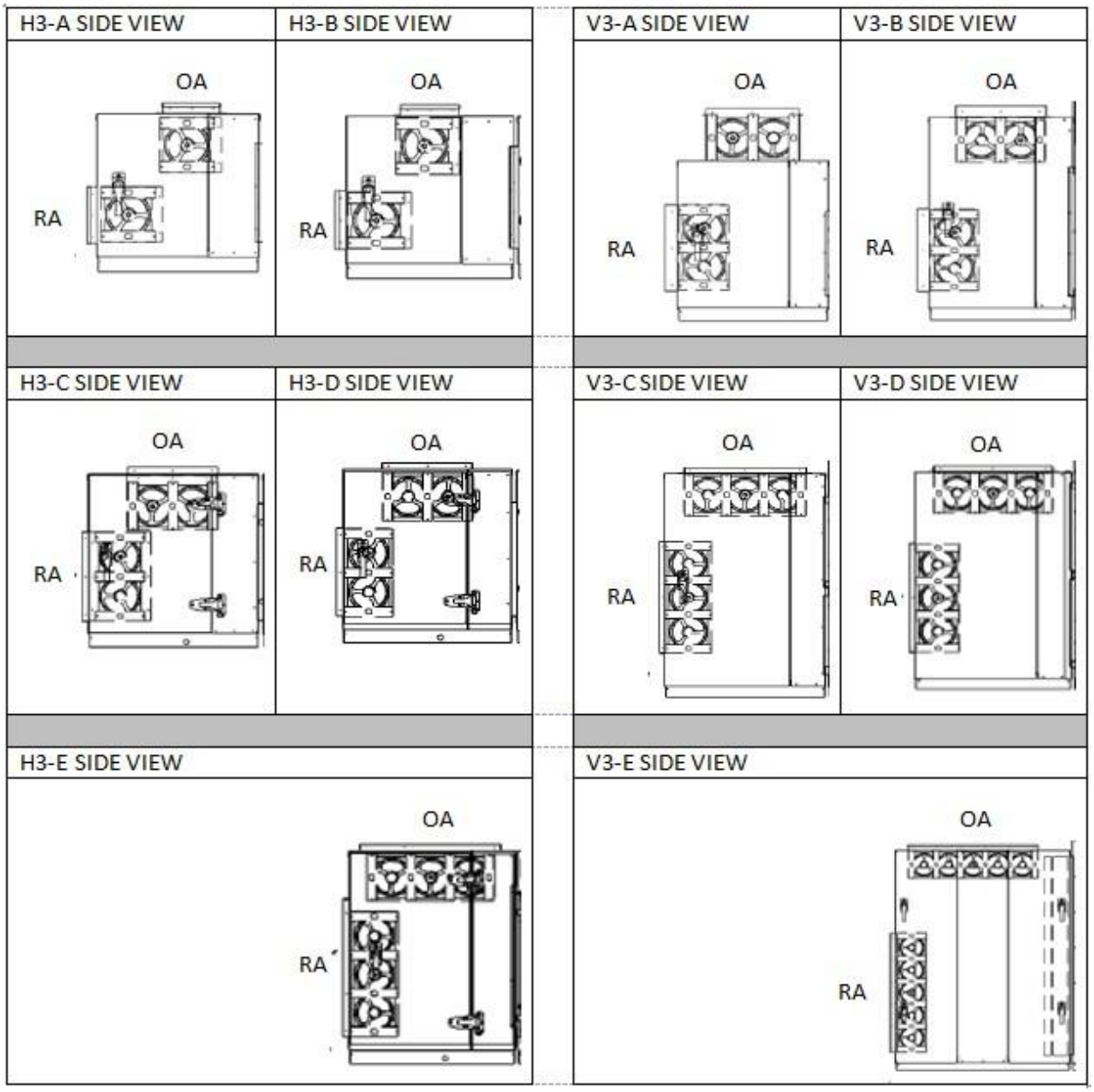


Figure 14 - Front RA, Top OA Mixing Box Arrangements
(Feature 5A = RA = normally open, Feature 5B = OA = normally closed)

Feature 6A
Pre Filter Box

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-**0**A0-00AA0BA-00-0AN0BB000

0 = *Standard - None*
A = *2" Pleated Unit Filter* - 2 inch pleated, MERV 8 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
B = *4" Pleated Unit Filter* - 4 inch pleated, MERV 8 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
C = *4" Pleated Unit Filter - MERV 11* - 4 inch pleated, MERV 11 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
D = *4" Pleated Unit Filter - MERV 13* - 4 inch pleated, MERV 13 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
E = *4" Pleated Unit Filter - MERV 14* - 4 inch pleated, MERV 14 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
F = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 8 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
G = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter - MERV 11* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 11 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
H = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter - MERV 13* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 13 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.
J = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter - MERV 14* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 14 unit filters mounted adjacent and upstream of the evaporator coil. Option is available on V3 Series E cabinet.

Feature 6B
Unit Filter Type

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0**A**0-00AA0BA-00-0AN0BB000

0 = *Standard - None*
A = *2" Pleated Unit Filter* - 2 inch pleated, MERV 8 unit filters mounted adjacent and upstream of the evaporator coil . Option is not available on V3 Series E cabinet.
B = *4" Pleated Unit Filter* - 4 inch pleated, MERV 8 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.
C = *4" Pleated Unit Filter - MERV 11* - 4 inch pleated, MERV 11 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.
D = *4" Pleated Unit Filter - MERV 13* - 4 inch pleated, MERV 13 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.
E = *4" Pleated Unit Filter - MERV 14* - 4 inch pleated, MERV 14 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.
F = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 8 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.
G = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter - MERV 11* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 11 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.
H = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter - MERV 13* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 13 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.
J = *2" Pleated Unit Filter - MERV 8 with 4" Pleated Unit Filter - MERV 14* - 2 inch pleated, MERV 8 unit filters mounted upstream of 4 inch pleated, MERV 14 unit filters mounted adjacent and upstream of the evaporator coil. Option is not available on V3 Series E cabinet.

Feature 6C
Final Filter Box

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A**0**-00AA0BA-00-0AN0BB000

0 = *Standard - None*
A = *2" Pleated Final Filter* - 2 inch pleated, MERV 8 final filters mounted downstream of the supply fan and heating. Option is available on H3 Series.
B = *12" Cartridge Final Filter - MERV 11* - 12 inch cartridge, MERV 11 final filters mounted downstream of the supply fan and heating. Option is available on H3 Series.
C = *12" Cartridge Final Filter - MERV 13* - 12 inch cartridge, MERV 13 final filters mounted downstream of the supply fan and heating. Option is available on H3 Series.
D = *12" Cartridge Final Filter - MERV 14* - 12 inch cartridge, MERV 14 final filters mounted downstream of the supply fan and heating. Option is available on H3 Series.
E = *2" Pleated Final Filter - MERV 8 with 12" Cartridge Final Filter - MERV 11* - 2 inch pleated, MERV 8 final filters mounted upstream of 12 inch cartridge, MERV 11 final filters mounted downstream of the supply fan and heating. Option is available on H3 Series.
F = *2" Pleated Final Filter - MERV 8 with 12" Cartridge Final Filter - MERV 13* - 2 inch pleated, MERV 8 final filters mounted upstream of 12 inch cartridge, MERV 13 final filters mounted downstream of the supply fan and heating. Option is available on H3 Series.
G = *2" Pleated Final Filter - MERV 8 with 12" Cartridge Final Filter - MERV 14* - 2 inch pleated, MERV 8 final filters mounted upstream of 12 inch cartridge, MERV 14 final filters mounted downstream of the supply fan and heating. Option is available on H3 Series.
H = *4" Pleated Final Filter -MERV 8* - 4 inch pleated, MERV 8 final filters mounted downstream of the supply fan and heating. Option is available on V3 Series size A-C. Not available with electric or gas heat options.
J = *4" Pleated Final Filter - MERV 11* - 4 inch pleated, MERV 11 final filters mounted downstream of the supply fan and heating. Option is available on V3 Series size A-C. Not available with electric or gas heat options.
K = *4" Pleated Final Filter - MERV 13* - 4 inch pleated, MERV 13 final filters mounted downstream of the supply fan and heating. Option is available on V3 Series size A-C. Not available with electric or gas heat options.
L = *4" Pleated Final Filter - MERV 14* - 4 inch pleated, MERV 14 final filters mounted downstream of the supply fan and heating. Option is available on V3 Series size A-C. Not available with electric or gas heat options.

Feature 7
Filter Options

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-**0**0AA0BA-00-0AN0BB000

0 = *Standard - None*
A = *Magnehelic Gauge* - Magnehelic gauge reading pressure drop across the filter bank and cooling coil. The gauge reads from 0 to 3 in. W.C. in 0.10 in. graduations, and is mounted in the coil access door.
B = *Clogged Filter Switch (CFS)* - Adjustable differential pressure switch sensing pressure drop across the unit filter bank and cooling coil. The range of adjustment is 0.17 to 5.0 in w.c. with contact closure on rise. The switch is mounted in the fan compartment with terminal connections in the low voltage control section. Normally open dry contacts are provided for clogged filter indication.
C = *Magnehelic Gauge + Clogged Filter Switch* - Options A + B
D = *Magnehelic Gauge – Unit Filter + ERW Filter* – Two magnehelic gauges; one reading pressure drop across the unit filter bank and cooling coil and one reading pressure drop across the OA filter and energy recovery wheel. The gauges read from 0 to 3 in. W.C. in 0.10 in. graduations.
F = *Clogged Filter Switch (CFS) – Unit Filter + ERW Filter* – Two adjustable differential pressure switches; one sensing pressure drop across the unit filter bank and cooling coil and one sensing pressure drop across the OA filter and energy recovery wheel. The range of adjustment is 0.17 to 5.0 in w.c. with contact closure on rise. The unit filter switch is mounted in the fan compartment with terminal connections in the low voltage control section. Normally open dry contacts are provided for clogged filter indication.
G = *Magnehelic Gauge + Clogged Filter Switch (Unit Filter + ERW Filter)* - Options D + F

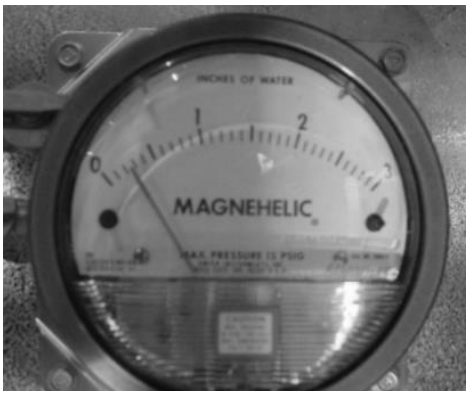


Figure 15 - Magnehelic Gauge

Note: A Special Pricing Authorization (SPA) is required if the CFS or Magnehelic gauge is to be used to respond to the pressure drop across only the cooling coil.

Feature 8
Coil Coating

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-0**0**AA0BA-00-0AN0BB000

0 = *Standard*
A = *Polymer E-Coated Cooling and Heating Coils* - Polymer e-coating applied to all coils configured in the unit (chilled water, hot water, steam, DX, reheat). Complete coil and casing are coated. Coating capable of withstanding at least 10,000 hours of salt spray per ASTM B117, yet is only 0.8-1.2 mils thick and has excellent flexibility. Option is intended for use in coastal saltwater conditions under the stress of heat, salt, sand and wind and is applicable to all corrosive environments where a polymer e-coating is acceptable. Coating includes a 5 year warranty, from the date of original equipment shipment from the factory. Instructions coil cleaning, maintenance, and recording keeping must be followed. Refer to the unit Installation, Operation and Maintenance Manual.
B = *Copper Finned Coils + Stainless Steel Coil Casing* - Coils are constructed of copper tubes with copper fins mechanically bonded to the tubes and stainless steel end casings. This option will be applied to all coils configured in the unit (chilled water, hot water, steam, DX, reheat).
D = *Standard Coils + Stainless Steel Coil Casing* - Coils are constructed of copper tubes with aluminum fins mechanically bonded to the tubes and stainless steel end casings. This option will be applied to all coils configured in the unit (chilled water, hot water, steam, DX, reheat).
E = *Polymer E-Coated Cooling and Heating Coils + Stainless Steel Coil Casing* - Coils are constructed of copper tubes with aluminum fins mechanically bonded to the tubes and stainless steel end casings. Polymer e-coating applied to all coils configured in the unit (chilled water, hot water, steam, DX, reheat). Complete coil and casing are coated. Coating capable of withstanding at least 10,000 hours of salt spray per ASTM B117, yet is only 0.8-1.2 mils thick and has excellent flexibility. Option is intended for use in coastal saltwater conditions under the stress of heat, salt, sand and wind and is applicable to all corrosive environments where a polymer e-coating is acceptable. Coating includes a 5 year warranty, from the date of original equipment shipment from the factory. Instructions coil cleaning, maintenance, and recording keeping must be followed. Refer to the unit Installation, Operation and Maintenance Manual.

Feature 9
Expansion Valve

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00**A**00BA-00-0AN0BB000

0 = *None* - Chilled water cooling or heating only air handling unit.
A = *Thermal Expansion Valves* - Factory installed thermal expansion valve on the evaporator coils. Expansion valve sensing bulb must be field installed on the suction line.

Feature 10
Expansion Valve Controls

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00A**A**0BA-00-0AN0BB000

0 = *None* - No DX cooling coil.
A = *Standard Control* - Factory installed standard thermal expansion valve control.

Feature 11
Exterior Corrosion Protection

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA**0**BA-00-0AN0BB000

0 = *Standard - None*
A = *AAON Gray Exterior Paint* - Cabinet exterior is primer washed then spray coated with a two-part polyurethane, heat-baked exterior paint. The paint is gray in color and capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with the ASTM B 117-95 test procedure.
B = *Special Price Authorization with Special Paint* - If a special paint color is specified, a set-up charge and price add per unit is required. Use this designation if other special paint options are necessary. The Applications Department must issue a Special Pricing Authorization (SPA) to include a non-standard option.

Feature 12
Tonnage

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0**B**A-00-0AN0BB000

When the H3 or V3 is selected in the split system software, this feature will be selected based on the condensing unit tonnage. When the H3 or V3 is selected as a standalone unit, this must be selected based on the tonnage of the matching condensing unit. This feature is used to determine the correct TXV(s), coil, and copper for the refrigeration system.

0 = *Standard - None* - Chilled water cooling or heating only air handling unit.
A = *2 ton Capacity* - Two ton capacity matching condensing unit.
B = *3 ton Capacity* - Three ton capacity matching condensing unit.
C = *4 ton Capacity* - Four ton capacity matching condensing unit.

Feature 12 – Tonnage Continued

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0**B**A-00-0AN0BB000

D = *5 ton Capacity* - Five ton capacity matching condensing unit.
E = *6 ton Capacity* - Six ton capacity matching condensing unit.
F = *7 ton Capacity* - Seven ton capacity matching condensing unit.
G = *8 ton Capacity* - Eight ton capacity matching condensing unit.
U = *9 ton Capacity* - Nine ton capacity matching condensing unit.
H = *10 ton Capacity* - Ten ton capacity matching condensing unit.
V = *11 ton Capacity* - Eleven ton capacity matching condensing unit.
W = *13 ton Capacity* - Thirteen ton capacity matching condensing unit.
J = *14 ton Capacity* - Fourteen ton capacity matching condensing unit.
Y = *15 ton Capacity* - Fifteen ton capacity matching condensing unit.
Z = *16 ton Capacity* - Sixteen ton capacity matching condensing unit.
K = *17 ton Capacity* - Seventeen ton capacity matching condensing unit.
1 = *18 ton Capacity* - Eighteen ton capacity matching condensing unit.
2 = *20 ton Capacity* - Twenty ton capacity matching condensing unit.
L = *22 ton Capacity* - Twenty-two ton capacity matching condensing unit.
M = *25 ton Capacity* - Twenty-five ton capacity matching condensing unit.
3 = *26 ton Capacity* - Twenty-six ton capacity matching condensing unit.
N = *30 ton Capacity* - Thirty ton capacity matching condensing unit.
P = *31 ton Capacity* - Thirty-one ton capacity matching condensing unit.
Q = *34 ton Capacity* - Thirty-four ton capacity matching condensing unit.
R = *40-45 ton Capacity* - Forty to forty five ton capacity matching condensing unit.
S = *50-55 ton Capacity* - Fifty to fifty five ton capacity matching condensing unit.
4 = *60 ton Capacity* - Sixty ton capacity matching condensing unit.
T = *63 ton Capacity* - Sixty-three ton capacity matching condensing unit.
5 = *70 ton Capacity* - Seventy ton capacity matching condensing unit.

Feature 13
Energy Recovery Type

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0B**A**-00-0AN0BB000

0 = *Standard* - No Energy Recovery Wheel
A = *Energy Recovery Wheel - Total + High CFM, Polymer* - Factory installed total energy recovery wheel. The wheel's polymer heat transfer material is coated with silica gel desiccant for sensible and latent recovery. The energy recovery wheel is designed for 100% outside air applications.

Feature 13 – Energy Recovery Type Continued

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0B**A**-00-0AN0BB000

C = *Energy Recovery Wheel - Total + High CFM, 1% Purge, Polymer* - Factory installed total energy recovery wheel. The wheel's polymer heat transfer material is coated with silica gel desiccant for sensible and latent recovery. The energy recovery wheel is designed for 100% outside air applications. Option also includes an adjustable purge sector, which can reduce carryover to no more than 1%. Used for applications which require limiting cross contamination of the ventilation air with exhaust air. This option is not available on H3 Series size D & E.
E = *Energy Recovery Wheel - Sensible + High CFM, Polymer* - Factory installed polymer sensible energy recovery wheel. The wheel's polymer heat transfer material is designed for sensible recovery. The energy recovery wheel is designed for 100% outside air applications.
G = *Energy Recovery Wheel - Sensible + High CFM, 1% Purge, Polymer* - Factory installed polymer sensible energy recovery wheel. The wheel's polymer heat transfer material is designed for sensible recovery. The energy recovery wheel is designed for 100% outside air applications. Option includes an adjustable purge sector, which can reduce carryover to no more than 1%. Used for applications which require limiting cross contamination of the ventilation air with exhaust air. This option is not available on H3 Series size D & E.
J = *Energy Recovery Wheel - Total + High CFM, Aluminum* - Factory installed total energy recovery wheel. The wheel's aluminum heat transfer material is coated with desiccant for sensible and latent recovery. The energy recovery wheel is designed for 100% outside air applications. This option is only available on V3 Series.
L = *Energy Recovery Wheel - Total + High CFM, 1% Purge, Aluminum* - Factory installed total energy recovery wheel. The wheel's aluminum heat transfer material is coated with desiccant for sensible and latent recovery. The energy recovery wheel is designed for 100% outside air applications. Option includes an adjustable purge sector, which can reduce carryover to no more than 1%. Used for applications which require limiting cross contamination of the ventilation air with exhaust air. This option is only available on V3 Series.

Feature 13 – Energy Recovery Type Continued

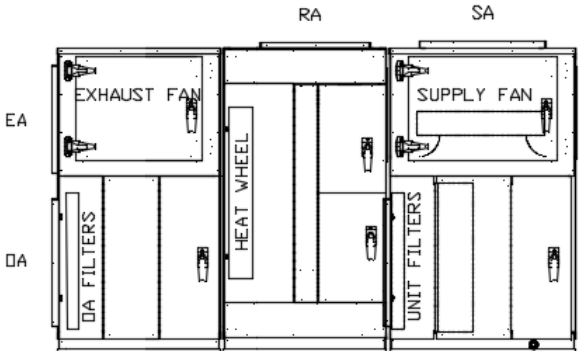


Figure 16 - V3 Energy Recovery Outside Air and Unit Filter Location
Note: Return air filters must be field provided and installed

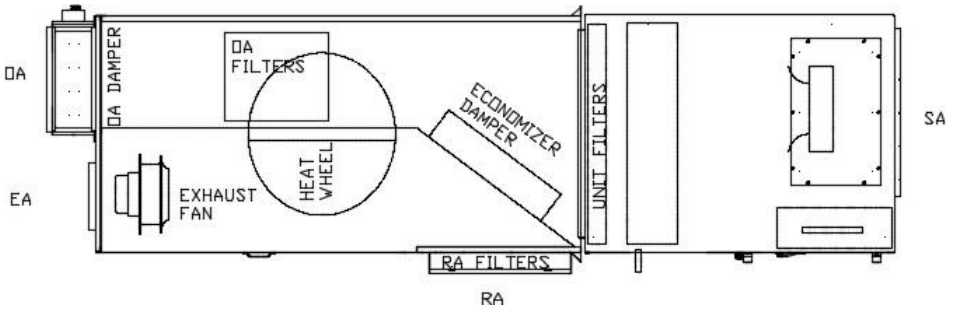


Figure 17 - H3 A,B,C Energy Recovery Outside Air, Return Air and Unit Filter Location (top view)

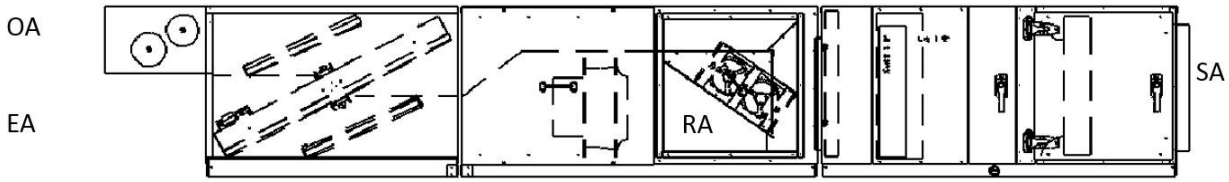


Figure 18 - H3 D,E Energy Recovery Outside Air, Return Air and Unit Filter Location (side view)

Note: If feature 1D = E or H (VCCX2 or AAON Touchscreen controls), an energy recovery wheel defrost cycle will occur that will disable the energy recovery wheel for 2 minutes when the outdoor air temperature is below the energy recovery defrost setpoint and if 30 minutes have lapsed since the last defrost cycle.

Feature 13 – Energy Recovery Type Continued

Table 3 - Energy Recovery Wheel Information

Cabinet Size	Polymer Energy Recovery Wheel		Aluminum Energy Recovery Wheel	
	Qty/Diameter/Depth	Maximum Air Flow Through the Wheel	Qty/Diameter/Depth	Maximum Air Flow Through the Wheel
V3-A	1/ 25”/ 3”	1200 SCFM	1/ 25”/ 3”	1260 SCFM
V3-B	1/ 30”/ 3”	2000 SCFM	1/ 30”/ 3”	2000 SCFM
V3-C	1/ 36”/ 3”	4000 SCFM	1/ 36”/ 3”	4000 SCFM
V3-D	1/ 46”/ 3”	6000 SCFM	1/ 46”/ 3”	6000 SCFM
V3-E	1/ 58”/ 3”	10000 SCFM	1/ 58”/ 3”	9200 SCFM
H3-A	1/ 25”/ 3”	1200 SCFM	N/A	N/A
H3-B	1/ 30”/ 3”	2000 SCFM		
H3-C	1/ 36”/ 3”	4000 SCFM		
H3-D	2/ 36”/ 3”	6000 SCFM		
H3-E	2/ 41”/ 3”	10000 SCFM		

Feature 14A
Power Options

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-**0**0-0AN0BB000

0 = *Standard Power Block*

Feature 14B
Electrical Rating

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-0**0**-0AN0BB000

0 = *Standard – 5 KAIC*
J = *10 KAIC*

Feature 15
Control Panel

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-**0**AN0BB000

0 = *Internal Control Panel* - Control panel is internal to the unit in the supply fan section. Access to the controls is through the access side of the unit. When internal control panel is selected, access to the supply fan changes from the hinged access door to 2 removable access panels. The H3 supply fan access panels are on the top and bottom of the supply fan section. The V3 supply fan access panels are on the front and back of the unit in accordance to Figure 3 and Figure 4. When Energy Recovery Wheel (Feature 13) is selected on a V3 unit, the supply fan access is through only one removable access panel on the front of the unit. The removable access panels have the same dimensions as the supply opening so the duct flanges and removable access panels can easily be interchanged to meet the application requirements (the exceptions are V3-E and H3-E).

- The internal control panel option is not available for units with electric heat.
- The internal control panel option is not available on 575V/3Φ/60Hz H3 units with dual supply fans, and 575V/3Φ/60Hz H3 units sizes A and B.

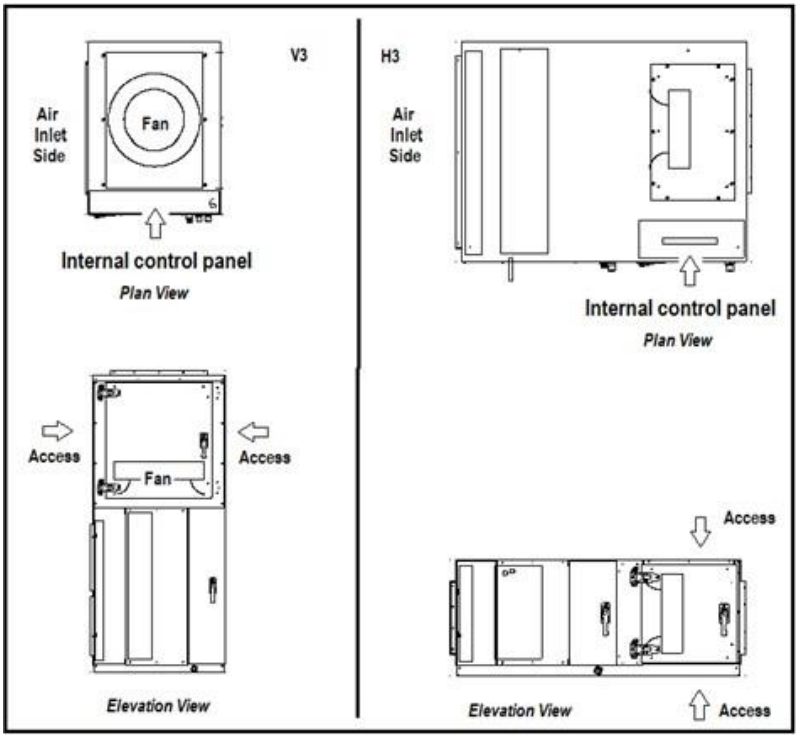


Figure 19 - Fan Access with Internal Control Panel

Feature 15 – Control Panel Continued

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-**0**AN0BB000

A = *Small Control Panel - 16" x 16"* - Small external control panel which can be attached to the unit or located near the unit. Six feet of separate control wiring with conduit and power wiring with conduit is factory provided between the control panel and unit.
B = *Medium Control Panel - 25" x 22"* - Medium external control panel which can be attached to the unit or located near the unit. Six feet of separate control wiring with conduit and power wiring with conduit is factory provided between the control panel and unit.
C = *Large Control Panel - 48" x 22"* - Large external control panel which can be attached to the unit or located near the unit. Six feet of separate control wiring with conduit and power wiring with conduit is factory provided between the control panel and unit.

Figure 20 - H3 with External Control Panel

D = *Removable Internal Control Panel (Single Side Access)* - Control panel is internal to the unit in the supply fan section. Access to the controls is on the access side of the unit through an access door with piano hinges and quarter turn lockable handles. The supply fan access is through unbolting the low voltage control panel, unsnapping the low voltage quick connects, and using the handles to remove the low voltage control panel. Only offered on the V3 Series.

- The removable internal control panel must be used for V3 Series units with the UL 60335-2-40 Compliant electric heat (B1=7)
- The removable internal control panel is not available on H3 Series units nor V3 Series sizes D and E.

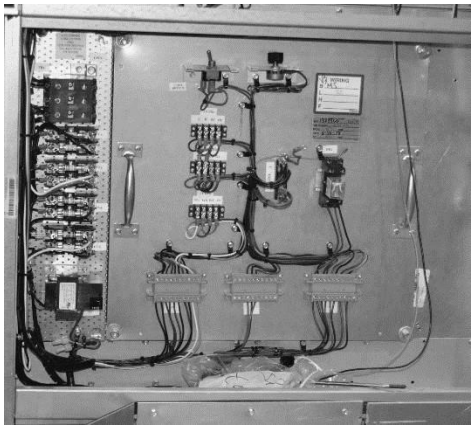


Figure 21 - Removable Low Voltage Internal Control Panel

Feature 16
Shipping Splits

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0**A**N0BB000

0 = *Standard* - No split, ship as one piece
A = *1 Shipping Split (2 pallets)*
B = *2 Shipping Splits (3 pallets)*
C = *3 Shipping Split (4 pallets)*
D = *4 Shipping Splits (5 pallets)*
E = *5 Shipping Split (6 pallets)*
H = *Special Shipping Split (SPA Required)*

Note: ECat populates the options based on what features are selected. See the example below. Every spot with a **"/"** indicates where the splits will be located.

Shipping Splits	
Code	Description
B	Exhaust Fan & Energy Recovery / Air Handler / Heat Box
C	Exhaust Fan / Energy Recovery / Air Handler / Heat Box
H	Special Shipping Split (SPA Required)

Figure 22 - ECat Ship Split Example

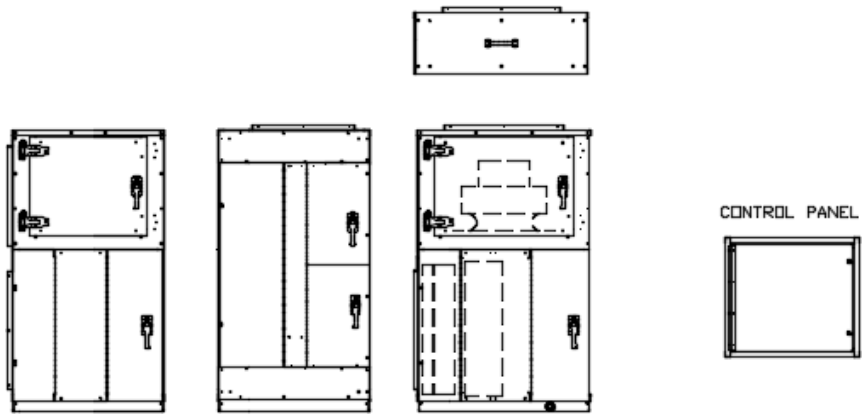


Figure 23 - V3 Shipping Split: Exhaust Fan/ Energy Recovery/ Air Handler/ Electric Heat

In the schematic above, the Control Panel will ship on the same pallet as the Air Handler section.

Feature 17
Energy Recovery Cabinet

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0A**N**0BB000

0 = *Standard* - No Energy Recovery Wheel
A = *Top RA + Back EA + Back OA Connections* - Energy Recovery Wheel with no factory installed dampers. This option includes 2" MERV 8 outside air filters (see Table 19 for specific sizes). Outside and exhaust air dampers must be field provided and installed. This option is available for the V3 only.

B = *Side RA + Back EA + Back OA Connections* - Energy Recovery Wheel with no factory installed dampers. This option includes 2" MERV 8 outside air and return air filters (see Table 20 and Table 21 for specific sizes). Outside and exhaust air dampers must be field provided and installed. This option is available for the H3 only.

G = *Outside Air + Exhaust Air Dampers - Top RA + Back EA + Back OA Connections* - Energy Recovery Wheel with factory installed on/off outside air and exhaust air dampers. The outside air damper will open with a 24VDC supply fan enable signal, and the supply fan will not be enabled until after the outside air damper is fully opened. The exhaust air damper will open with a 24VDC exhaust fan enable signal, and the exhaust fan will not be enabled until after the exhaust air damper is fully opened. This option includes 2" MERV 8 outside air filters (see Table 19 for specific sizes). This option is available for the V3 only.

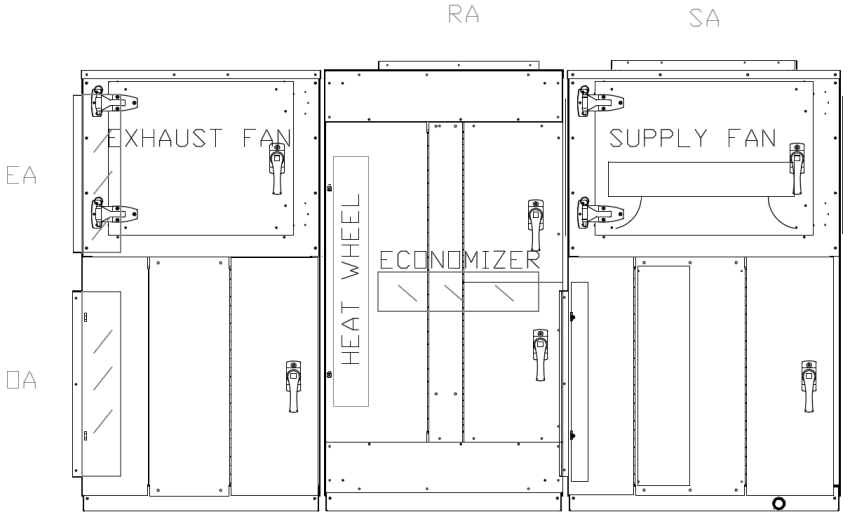


Figure 24 - V3 Energy Recovery Wheel Damper Locations (Side View)

Feature 17 - Energy Recovery Cabinet Continued

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0A**N**0BB000

N = *Outside Air + Economizer Dampers - Top RA + Back EA + Back OA Connections* - Energy Recovery Wheel with factory installed modulating outside air damper and modulating economizer damper. The economizer damper is installed as shown in Figure 24. Exhaust air dampers must be field provided and installed. If feature 1D = C or D field installed controls, the economizer damper includes an actuator with terminal strip labeled EC in the controls compartment for a field supplied outside air control signal. Actuator is factory configured for a 0-10VDC control signal. Also included on the terminal strip is an energy recovery wheel enable so that when the unit is in Economizer mode, the heat wheel can be disabled. If feature 1D = E or H factory installed controls, an outdoor air temperature sensor will be factory provided and the economizer dampers will modulate based on that sensor. The energy recovery wheel will not operate during economizer mode of operation. This option includes 2" MERV 8 outside air filters (see Table 19 for specific sizes). This option is available for the V3 only.

P = *Outside Air + Economizer Dampers - Side RA + Back EA + Back OA Connections* - Energy Recovery Wheel with factory installed modulating outside air damper and modulating economizer damper. The economizer damper is installed as shown in Figure 25. Exhaust air dampers must be field provided and installed. If feature 1D = C or D field installed controls, the economizer damper includes an actuator with terminal strip labeled EC in the controls compartment for a field supplied outside air control signal. Actuator is factory configured for a 0-10VDC control signal. Also included on the terminal strip is an energy recovery wheel enable so that when the unit is in Economizer mode, the heat wheel can be disabled. If feature 1D = E or H factory installed controls, an outdoor air temperature sensor will be factory provided and the economizer dampers will modulate based on that sensor. The energy recovery wheel will not operate during economizer mode of operation. This option includes 2" MERV 8 outside air and return air filters (see Table 20 and Table 21 for specific sizes). This option is available for the H3 only.

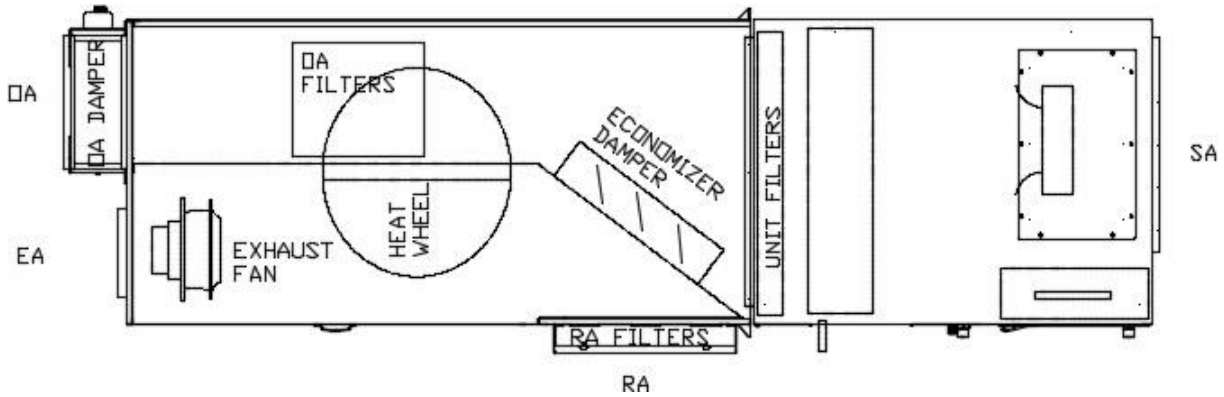


Figure 25 - H3 Energy Recovery Wheel Damper Locations (Top View)

Feature 17 - Energy Recovery Cabinet Continued

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0A**N**0BB000

U = *Outside Air + Exhaust Air + Economizer Dampers - Top RA + Back EA + Back OA Connections* - Energy Recovery Wheel with factory installed modulating outside air damper and modulating economizer damper and factory installed on/off exhaust air damper. The economizer damper is installed as shown in Figure 24. The on/off exhaust air damper will open with a 24VDC exhaust fan enable signal, and the exhaust fan will not be enabled until after the exhaust air damper is fully opened. If feature 1D = C or D field installed controls, the economizer damper includes an actuator with terminal strip labeled EC in the controls compartment for a field supplied outside air control signal. Actuator is factory configured for a 0-10VDC control signal. Also included on the terminal strip is an energy recovery wheel enable so that when the unit is in Economizer mode, the heat wheel can be disabled. If feature 1D = E or H factory installed controls, an outdoor air temperature sensor will be factory provided and the economizer dampers will modulate based on that sensor. The energy recovery wheel will not operate during economizer mode of operation. This option includes 2" MERV 8 outside air filters (see Table 19 for specific sizes). This option is available for the V3 only.

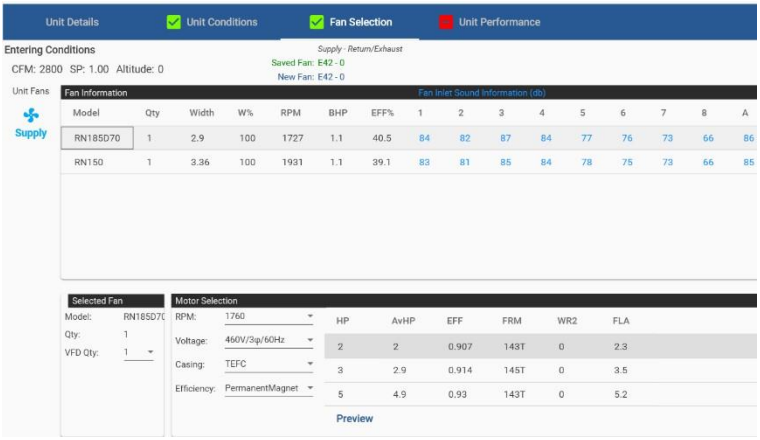
Feature 18
Preheat

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN**0**BB000

0 = *Standard - None*

Feature 19
Exhaust Fan

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0**B**B000



0 = *Standard* - None
A = *250 mm Exhaust Fan, 800 W EC Motor*
B = *310 mm Exhaust Fan, 1.0 kW EC Motor*
C = *310 mm Exhaust Fan, 1.7 kW EC Motor*
D = *355 mm Exhaust Fan, 1.7 kW EC Motor*
E = *450 mm Exhaust Fan, 3.0 kW EC Motor*
F = *450 mm Exhaust Fan, 6.0 kW EC Motor*
G = *Dual 310 mm Exhaust Fan, 1.0 kW EC Motor*
H = *Dual 310 mm Exhaust Fan, 1.7 kW EC Motor*
J = *Dual 355 mm Exhaust Fan, 1.7 kW EC Motor*
K = *Dual 450 mm Exhaust Fan, 3.0 kW EC Motor*
L = *Dual 450 mm Exhaust Fan, 6.0 kW EC Motor*
M = *Option A + Piezo Ring**
N = *Option B + Piezo Ring**
P = *Option C + Piezo Ring**
Q = *Option D + Piezo Ring**
R = *Option E + Piezo Ring**
S = *Option F + Piezo Ring**
T = *Option G + Piezo Ring**
U = *Option H + Piezo Ring**
V = *Option J + Piezo Ring**
W = *Option K + Piezo Ring**
Y = *Option L + Piezo Ring**

*[M-Y] - Piezo Ring feature includes designed holes in the inlet cone, which can be used to determine the exhaust CFM during operation. Controls must be field provided.

AAON ECat will select the correct available options for Feature 19 based on unit conditions and the input from the fan selection program. When all of the other features have been selected, you will be prompted to select exhaust fans under the “Fan Selection” window. In the “Fan Selection” window you will be able to choose the motor based on RPM, efficiency, or sound information. Fan curves will be available for viewing in the “Fan Curve” tab.

Feature 20
Crating

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0B**B**000

0 = *Standard* - Standard crating includes a wood pallet and a crate fabricated of dimensional lumber and plywood. Crating must be field disassembled and wood pallet must be removed for unit installation. Lockable access doors are shipped with a nut and bolt through the latch.
A = *Export Crating* - Optional crating of the unit with additional supports for overseas shipping. Option includes a wood pallet, and a completely enclosed crate fabricated of dimensional lumber and plywood. Crating must be field disassembled and wood pallet must be removed for unit installation. Lockable access doors are shipped with a nut and bolt through the latch.
B = *Forkliftable Base - 5"Base* - Option includes a factory installed 5in tall sheet metal base with fork lift pockets for ease of installation. This option is available for the V3 only.
C = *Export Crating + Shipping Shrink Wrap* - Options A + E
D = *Export Crating + Forkliftable Base* - Options A + B. This option is available for the V3 only.
E = *Shipping Shrink Wrap* - Option includes special heat shrink plastic covering the entire unit for supplemental unit protection. Unit is also crated in accordance to the standard crating option.
F = *Forkliftable Base + Shipping Shrink Wrap* - Options B + E. This option is available for the V3 only.
G = *Export Crating + Forkliftable Base + Shipping Shrink Wrap* - Options A + B + E.
This option is available for the V3 only.

Figure 26 - Standard Crating

Figure 27 - Shipping Shrink Wrap

Feature 21
Additional Controls

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB**0**00

0 = *Standard - None*
D = *High Condensate Level Switch* - Control switch that shuts down the 24V control circuit when a high water level in the drain pan is detected to prevent overflow.

Feature 22
Warranty

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB0**0**0

0 = *Standard - 1 Year Parts* - Parts only warranty for a period of 12 months from the date of equipment startup or 18 months from the date of shipment, whichever is less.
A = *2 Year Parts Only Warranty (Begins at Date of Shipment)* - Parts only warranty for a period of 24 months from the date of shipment.
B = *3 Year Parts Only Warranty (Begins at Date of Shipment)* - Parts only warranty for a period of 36 months from the date of shipment.
C = *4 Year Parts Only Warranty (Begins at Date of Shipment)* - Parts only warranty for a period of 48 months from the date of shipment.
D = *5 Year Parts Only Warranty (Begins at Date of Shipment)* - Parts only warranty for a period of 60 months from the date of shipment.

Feature 23
Type

Example: V3-BRB-3-0-161C-000:ABCC-FGL-000-0A0-00AA0BA-00-0AN0BB00**0**

0 = *Standard*
X = *Special Price Authorization* - The Applications Department must issue a Special Pricing Authorization (SPA) to include a non-standard option.

General Data
Unit Information

Table 4 - A Cabinet (up to 1,200 cfm) Fan and Energy Recovery Information

	Model	
	H3-A	V3-A
Supply Fans		
Quantity/Type	1/ ECM Driven Direct Drive Backward Curved Plenum OR 1/ VFD Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel Exhaust Fans		
Quantity/Type	1/ ECM Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel		
Qty/Wheel Diameter/Width	1 / 25" / 3"	
Maximum Airflow (cfm)	1,200 (Polymer)	1,200 (Polymer) 1,200 (Aluminum)

Table 5 - A Cabinet (up to 1,200 cfm) Cooling Information

	Model	
	H3-A	V3-A
Evaporator Coil		
Number of Circuits	1 or 2, Interlaced	
Quantity/Face Area	1/2.08 ft^2	
Rows/fpi	4 row/14 fpi or 6 row/12 fpi	
Chilled Water Cooling Coil		
Quantity/Face Area	1/2.08 ft^2	
Rows/fpi	4, 6 or 8 rows / 8, 10 or 12 fpi (Double, Single, Half or Quarter Serpentine)	
Standard Coil	Single Serpentine with 10 fpi	

Table 6 - A Cabinet (up to 1,200 cfm) Heating Information

	Model	
	H3-A	V3-A
Hot Water Heating Coil		
Quantity/Face Area	1/2.08 ft^2	
Rows/fpi	1 or 2 row / 12 fpi (Single, Half or Quarter Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Steam Heating Coil		
Quantity/Face Area	1/2.08 ft^2	
Rows/fpi	1 or 2 rows / 12 fpi (Single Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Electric Heat		
Capacity (kW)		
230/460V 3Φ	7, 14, 21, 28	7, 14, 21, 28
208V 3Φ	5.3, 10.5	5.3, 10.5
Stages	7 kW - 1 14 kW - 1, 2 21 kW – 2 28 kW - 2	7 kW - 1 14 kW - 1, 2 21 kW – 2 28 kW - 2
	All kW options can also be Fully Modulating with SCR	

Table 7 - B Cabinet (up to 2,000 cfm) Fan and Energy Recovery Information

	Model	
	H3-B	V3-B
Supply Fans		
Quantity/Type	1/ ECM Driven Direct Drive Backward Curved Plenum OR 1/ VFD Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel Exhaust Fans		
Quantity/Type	1/ ECM Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel		
Qty/Wheel Diameter/Width	1 / 34" / 3"	
Maximum Airflow (cfm)	2,000 (Polymer)	2,000 (Polymer) 2,000 (Aluminum)

Table 8 - B Cabinet (up to 2,000 cfm) Cooling Information

	Model	
	H3-B	V3-B
Evaporator Coil		
Number of Circuits	1 or 2, Interlaced	
Quantity/Face Area	1/3.54 ft^2	1/3.67 ft^2
Rows/fpi	4 row/14 fpi or 6 row/12 fpi	
Chilled Water Cooling Coil		
Quantity/Face Area	1/3.54 ft^2	1/3.44 ft^2
Rows/fpi	4, 6 or 8 rows/8, 10 or 12 fpi (Double, Single, Half or Quarter Serpentine)	
Standard Coil	Single Serpentine with 10 fpi	

Table 9 - B Cabinet (up to 2,000 cfm) Heating Information

	Model	
	H3-B	V3-B
Hot Water Heating Coil		
Quantity/Face Area	1/3.54 ft^2	1/3.44 ft^2
Rows/fpi	1 or 2 rows/12 fpi (Single, Half or Quarter Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Steam Heating Coil		
Quantity/Face Area	1/3.49 ft^2	1/3.58 ft^2
Rows/fpi	1 or 2 rows/12 fpi (Single Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Electric Heat		
Capacity (kW)		
230/460V 3Φ	7, 14, 21, 28, 35, 42	7, 14, 21, 28, 35, 42
208V 3Φ	5.3, 10.5, 15.8, 21, 26.3, 31.5	5.3, 10.5, 15.8, 21, 26.3, 31.5
Stages	7 kW - 1 14 kW - 1, 2 21 kW -2, 3 28 kW – 2, 3 35 kW – 2, 3 42 kW – 2, 3	7 kW - 1 14 kW - 1, 2 21 kW -2, 3 28 kW – 2, 3 35 kW – 2, 3 42 kW – 2, 3
	All kW options can also be Fully Modulating with SCR	
Gas Heat		
Input Capacity/Output Capacity (MBH)	90/83.7	
Natural Gas Capacity Steps (MBH)	Modulating - 5:1 Turndown	
LP Gas Capacity Steps (MBH)	Modulating - 3:1 Turndown	

Table 10 - C Cabinet (up to 4,000 cfm) Fan and Energy Recovery Information

	Model	
	H3-C	V3-C
Supply Fans		
Quantity/Type	1 or 2/ ECM Driven Direct Drive Backward Curved Plenum OR 1 or 2/ VFD Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel Exhaust Fans		
Quantity/Type	1 or 2/ ECM Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel		
Qty/Wheel Diameter/Width	1/ 40" / 3"	
Maximum Airflow (cfm)	4,000 (Polymer)	4,000 (Polymer) 4,000 (Aluminum)

Table 11 - C Cabinet (up to 4,000 cfm) Cooling Information

	Model	
	H3-C	V3-C
Evaporator Coil		
Number of Circuits	1 or 2, Interlaced	
Quantity/Face Area	1/7.22 ft^2	1/7.11 ft^2
Rows/fpi	4 row/14 fpi or 6 row/12 fpi	
Chilled Water Cooling Coil		
Quantity/Face Area	1/7.22 ft^2	
Rows/fpi	4, 6 or 8 rows / 8, 10 or 12 fpi (Double, Single, Half or Quarter Serpentine)	
Standard Coil	Single Serpentine with 10 fpi	

Table 12 - C Cabinet (up to 4,000 cfm) Heating Information

	Model	
	H3-C	V3-C
Hot Water Heating Coil		
Quantity/Face Area	1/7.22 ft^2	
Rows/fpi	1 or 2 rows / 12 fpi (Single, Half or Quarter Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Steam Heating Coil		
Quantity/Face Area	1/6.97 ft^2	1/7.33 ft^2
Rows/fpi	1 or 2 rows / 12 fpi (Single Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Electric Heat		
Capacity (kW)		
230/460V 3Φ	7, 14, 21, 28, 35, 42, 49, 56, 63, 70	7, 14, 21, 28, 35, 42, 49, 56, 63, 70
208V 3Φ	5.3, 10.5, 15.8, 21.0, 26.3, 31.5, 37.0, 42.0, 47.3, 52.5	5.3, 10.5, 15.8, 21.0, 26.3, 31.5, 37.0, 42.0, 47.3, 52.5
Stages	7 kW - 1 14 kW - 1, 2 21 kW - 2, 3 28 kW – 2, 3, 4 35 kW - 2, 3, 4, 5 42 kW – 2, 3, 4, 5 49 kW – 2, 3, 4, 5 56 kW – 2, 3, 4, 5 63 kW - 2, 3, 4, 5 70 kW - 2, 3, 4, 5	7 kW - 1 14 kW - 1, 2 21 kW - 2, 3 28 kW – 2, 3, 4 35 kW - 2, 3, 4, 5 42 kW – 2, 3, 4, 5 49 kW – 2, 3, 4, 5 56 kW – 2, 3, 4, 5 63 kW - 2, 3, 4, 5 70 kW - 2, 3, 4, 5
	All kW options can also be Fully Modulating with SCR	
Gas Heat		
Input Capacity/Output Capacity (MBH)	90/83.7, 135/125.6, 180/167.7, 225/209.3	
Natural Gas Capacity Steps (MBH)	Modulating - 5:1 Turndown	
LP Gas Capacity Steps (MBH)	Modulating - 3:1 Turndown	

Table 13 - D Cabinet (up to 6,000 cfm) Fan and Energy Recovery Information

	Model	
	H3-D	V3-D
Supply Fans		
Quantity/Type	1 or 2/ ECM Driven Direct Drive Backward Curved Plenum OR 1 or 2/ VFD Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel Exhaust Fans		
Quantity/Type	1 or 2/ ECM Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel		
Qty/Wheel Diameter/Width	2 / 40" / 3"	1 / 50" / 3"
Maximum Airflow (cfm)	6,000 (Polymer)	6,000 (Polymer) 6,000 (Aluminum)

Table 14 - D Cabinet (up to 6,000 cfm) Cooling Information

	Model	
	H3-D	V3-D
Evaporator Coil		
Number of Circuits	1 or 2, Interlaced	
Quantity/Face Area	1/10.28 ft^2	1/10.22 ft^2
Rows/fpi	4 row/14 fpi or 6 row/12 fpi	
Chilled Water Cooling Coil		
Quantity/Face Area	1/10.28 ft^2	1/10.38 ft^2
Rows/fpi	4, 6 or 8 rows/8, 10 or 12 fpi (Double, Single, Half or Quarter Serpentine)	
Standard Coil	Single Serpentine with 10 fpi	

Table 15 - D Cabinet (up to 6,000 cfm) Heating Information

	Model	
	H3-D	V3-D
Hot Water Heating Coil		
Quantity/Face Area	1/10.28 ft^2	1/10.38 ft^2
Rows/fpi	1 or 2 rows/12 fpi (Single, Half or Quarter Serpentine)	
Standard Coil	Single Serpentine with 12 fpi	
Steam Heating Coil		
Quantity/Face Area	1/10.02 ft^2	1/10.54 ft^2
Rows/fpi	1 or 2 rows/12 fpi (Single Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Electric Heat		
Capacity (kW)		
230/460V 3Φ	14, 28, 42, 56, 70, 84	
208V 3Φ	10.5, 21.0, 31.5, 42.0, 52.5, 63	
Stages	14 kW - 1, 2 28 kW – 2, 3, 4 42 kW – 2, 3, 4, 5, 6 56 kW – 2, 3, 4 70 kW – 2, 3, 4, 5 84 kW - 2, 3, 4, 5, 6	14 kW - 1, 2 28 kW – 2, 3, 4 42 kW – 2, 3, 4, 5, 6 56 kW – 2, 3, 4 70 kW – 2, 3, 4, 5 84 kW - 2, 3, 4, 5, 6
	All kW options can also be Fully Modulating with SCR	
Gas Heat		
Input Capacity/Output Capacity (MBH)	180/167.7, 225/209.3	
Natural Gas Capacity Steps (MBH)	Modulating - 5:1 Turndown	
LP Gas Capacity Steps (MBH)	Modulating - 3:1 Turndown	

Table 16 - E Cabinet (up to 10,000 cfm) Fan and Energy Recovery Information

	Model	
	H3-E	V3-E
Supply Fans		
Quantity/Type	1 or 2/ ECM Driven Direct Drive Backward Curved Plenum OR 1 or 2/ VFD Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel Exhaust Fans		
Quantity/Type	1 or 2/ ECM Driven Direct Drive Backward Curved Plenum	
Energy Recovery Wheel		
Qty/Wheel Diameter/Width	2 / 44" / 3"	1 / 63" / 3"
Maximum Airflow (cfm)	10,000 (Polymer)	10,000 (Polymer) 9,200 (Aluminum)

Table 17 - E Cabinet (up to 10,000 cfm) Cooling Information

	Model	
	H3-E	V3-E
Evaporator Coil		
Number of Circuits	1 or 2, Interlaced	
Quantity/Face Area	1/17.50 ft^2	1/17.25 ft^2
Rows/fpi	4 row/14 fpi or 6 row/12 fpi	
Chilled Water Cooling Coil		
Quantity/Face Area	1/17.19 ft^2	1/17.57 ft^2
Rows/fpi	4, 6 or 8/8, 10 or 12 (Double, Single, Half or Quarter Serpentine)	
Standard Coil	Single Serpentine with 10 fpi	

Table 18 - E Cabinet (up to 10,000 cfm) Heating Information

	Model	
	H3-E	V3-E
Hot Water Heating Coil		
Quantity/Face Area	1/17.19 ft^2	1/17.57 ft^2
Rows/fpi	1 or 2/12 (Single, Half or Quarter Serpentine)	
Standard Coil	Single Serpentine with 12 fpi	
Steam Heating Coil		
Quantity/Face Area	1/16.88 ft^2	1/17.25 ft^2
Rows/fpi	1 or 2/12 (Single Serpentine)	
Standard Coil	1 Row Single Serpentine 12 fpi	
Electric Heat		
Capacity (kW)		
230/460V 3Φ	14, 28, 42, 56, 70, 84	14, 28, 42, 56, 70, 84
208V 3Φ	10.5, 21.0, 31.5, 42.0, 52.5, 63	10.5, 21.0, 31.5, 42.0, 52.5, 63
Stages	14 kW - 1, 2 28 kW – 2, 3, 4 42 kW – 2, 3, 4, 5, 6 56 kW – 2, 3, 4, 5, 6 70 kW – 2, 3, 4, 5, 6 84 kW - 2, 3, 4, 5, 6	14 kW - 1, 2 28 kW – 2, 3, 4 42 kW – 2, 3, 4, 56 kW – 2, 3, 4 70 kW – 2, 3, 4 84 kW - 2, 3, 4,
	All kW options can also be Fully Modulating with SCR	

Filter Information

Table 19 - V3 Series Energy Recovery OA Filters (Feature 13 ≠ 0)

Unit Size	(Qty.) Size (cm) [in.]	Type
A	(1) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated, MERV 8
B	(1) 61 x 61 x 5.1 [24 x 24 x 2]	Pleated, MERV 8
C	(4) 40.6 x 50.8 x 5.1 [16 x 20 x 2]	Pleated, MERV 8
D	(4) 45.7 x 61 x 5.1 [18 x 24 x 2]	Pleated, MERV 8
E	(8) 40.6 x 50.8 x 5.1 [16 x 20 x 2]	Pleated, MERV 8

Table 20 - H3 Series Energy Recovery OA Filters (Feature 13 ≠ 0)

Unit Size	(Qty.) Size (cm) [in.]	Type
A	(1) 61 x 30.5 x 5.1 [24 x 12 x 2]	Pleated, MERV 8
B	(1) 50.8 x 63.5 x 5.1 [20 x 25 x 2]	Pleated, MERV 8
C	(2) 61 x 61 x 5.1 [24 x 24 x 2]	Pleated, MERV 8
D	(4) 40.6 x 50.8 x 5.1 (1) 50.8 x 50.8 5.1 [16 x 20 x 2 and 20 x 20 x 2]	Pleated, MERV 8
E	(6) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated, MERV 8

Table 21 - H3 Series Energy Recovery RA Filters (Feature 13 ≠ 0)

Unit Size	(Qty.) Size (cm) [in.]	Type
A	(1) 40.6 x 50.8 x 5.1 [16 x 20 x 2]	Pleated, MERV 8
B	(1) 50.8 x 63.5 x 5.1 [20 x 25 x 2]	Pleated, MERV 8
C	(2) 50.8 x 63.5 x 5.1 [20 x 25 x 2]	Pleated, MERV 8
D	(4) 40.6 x 50.8 x 5.1 (1) 50.8 x 50.8 5.1 [16 x 20 x 2 and 20 x 20 x 2]	Pleated, MERV 8
E	(6) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated, MERV 8

Table 22 - V3 Series E Cabinet Pre Filters

Feature 6A	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(6) 45.7 x 61 x 5.1 [18 x 24 x 2]	Pleated, MERV 8
B	(6) 45.7 x 61 x 10.2 [18 x 24 x 4]	Pleated, MERV 8
C		Pleated, MERV 11
D		Pleated, MERV 13
E		Pleated, MERV 14
F	(6) 45.7 x 61 x 5.1 and (6) 45.7 x 61 x 10.2 [18 x 24 x 2 and 18 x 24 x 4]	Pleated, MERV 8 and Pleated, MERV 8
G		Pleated, MERV 8 and Pleated, MERV 11
H		Pleated, MERV 8 and Pleated, MERV 13
J		Pleated, MERV 8 and Pleated, MERV 14

Table 23 - H3 Series A Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(1) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated MERV 8
B	(1) 40.6 x 63.5 x 10.2 [16 x 25 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(1) 40.6 x 63.5 x 5.1 and (1) 40.6 x 63.5 x 10.2 [16 x 25 x 2 and 16 x 25 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 24 - V3 Series A Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(1) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated MERV 8
B	(1) 40.6 x 63.5 x 10.2 [16 x 25 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(1) 40.6 x 63.5 x 5.1 and (1) 40.6 x 63.5 x 10.2 [16 x 25 x 2 and 16 x 25 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 25 - H3 Series B Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(2) 40.6 x 50.8 x 5.1 [16 x 20 x 2]	Pleated MERV 8
B	(2) 40.6 x 50.8 x 10.2 [16 x 20 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(2) 40.6 x 50.8 x 5.1 and (2) 40.6 x 50.8 x 10.2 [16 x 20 x 2 and16 x 20 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 26 - V3 Series B Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(1) 61 x 61 x 5.1 [24 x 24 x 2]	Pleated MERV 8
B	(1) 61 x 61 x 10.2 [24 x 24 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(1) 61 x 61 x 5.1 and (1) 61 x 61 x 10.2 [24 x 24 x 2 and 24 x 24 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 27 - H3 Series C Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(2) 50.8 x 50.8 x 5.1 and (1) 40.6 x 50.8 x 5.1 [20 x 20 x 2 and 16 x 20 x 2]	Pleated MERV 8
B	(2) 50.8 x 50.8 x 10.2 and (1) 40.6 x 50.8 x 10.2 [20 x 20 x 4 and 16 x 20 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(2) 50.8 x 50.8 x 5.1 and (1) 40.6 x 50.8 x 5.1 and (2) 50.8 x 50.8 x 10.2 and (1) 40.6 x 50.8 x 10.2 [20 x 20 x 2 and 16 x 20 x 2] and [20 x 20 x 4 and 16 x 20 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 28 - V3 Series C Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(4) 40.6 x 50.8 x 5.1 [16 x 20 x 2]	Pleated MERV 8
B	(4) 40.6 x 50.8 x 10.2 [16 x 20 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(4) 40.6 x 50.8 x 5.1 and (4) 40.6 x 50.8 x 10.2 [16 x 20 x 2 and16 x 20 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 29 - H3 Series D Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(1) 50.8 x 50.8 x 5.1 and (4) 40.6 x 50.8 x 5.1 [20 x 20 x 2 and 16 x 20 x 2]	Pleated MERV 8
B	(1) 50.8 x 50.8 x 10.2 and (4) 40.6 x 50.8 x 10.2 [20 x 20 x 4 and 16 x 20 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(1) 50.8 x 50.8 x 5.1 and (4) 40.6 x 50.8 x 5.1 and (1) 50.8 x 50.8 x 10.2 and (4) 40.6 x 50.8 x 10.2 [20 x 20 x 2 and 16 x 20 x 2] and [20 x 20 x 4 and 16 x 20 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 30 - V3 Series D Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Unit Filters	
A	(4) 45.7 x 61 x 5.1 [18 x 24 x 2]	Pleated, MERV 8
B	(4) 45.7 x 61 x 10.2 [18 x 24 x 4]	Pleated, MERV 8
C		Pleated, MERV 11
D		Pleated, MERV 13
E		Pleated, MERV 14
F	(4) 45.7 x 61 x 5.1 and (4) 45.7 x 61 x 10.2 [18 x 24 x 2 and 18 x 24 x 4]	Pleated, MERV 8 and Pleated, MERV 8
G		Pleated, MERV 8 and Pleated, MERV 11
H		Pleated, MERV 8 and Pleated, MERV 13
J		Pleated, MERV 8 and Pleated, MERV 14

Table 31 - H3 Series E Cabinet Unit Filters

Feature 6B	(Qty.) Size (cm) [in.]	Type
0	No Pre Filters	
A	(6) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated MERV 8
B	(6) 40.6 x 63.5 x 10.2 [16 x 25 x 4]	Pleated MERV 8
C		Pleated MERV 11
D		Pleated MERV 13
E		Pleated MERV 14
F	(6) 40.6 x 63.5 x 5.1 and (6) 40.6 x 63.5 x 10.2 [16 x 25 x 2 and 16 x 25 x 4]	Pleated MERV 8 and Pleated MERV 8
G		Pleated MERV 8 and Pleated MERV 11
H		Pleated MERV 8 and Pleated MERV 13
J		Pleated MERV 8 and Pleated MERV 14

Table 32 - H3 Series A Cabinet Final Filters

Feature 6C	(Qty.) Size (cm) [in.]	Type
0	No Final Filters	
A	(1) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated MERV 8
B	(1) 40.6 x 63.5 x 30.5 [16 x 25 x 12]	Cartridge MERV 11
C		Cartridge MERV 13
D		Cartridge MERV 14
E	(1) 40.6 x 63.5 x 5.1 and 40.6 x 63.5 x 30.5 [16 x 25 x 2 and 16 x 25 x 12]	Pleated MERV 8 and Cartridge MERV 11
F		Pleated MERV 8 and Cartridge MERV 13
G		Pleated MERV 8 and Cartridge MERV 14

Table 33 - V3 Series A Cabinet Final Filters

Feature 6C	(Qty.) Size (cm) [in.]	Type
0	No Final Filters	
H	(1) 40.6 x 63.5 x 10.2 [16 x 25 x 4]	Pleated, MERV 8
J		Pleated, MERV 11
K		Pleated, MERV 13
L		Pleated, MERV 14

Table 34 - H3 Series B Cabinet Final Filters

Feature 6C	(Qty.) Size (cm) [in.]	Type
0	No Final Filters	
A	(2) 40.6 x 50.8 x 5.1 [16 x 20 x 2]	Pleated MERV 8
B	(2) 40.6 x 50.8 x 30.5 [16 x 20 x 12]	Cartridge MERV 11
C		Cartridge MERV 13
D		Cartridge MERV 14
E	(2) 40.6 x 50.8 x 5.1 and (2) 40.6 x 50.8 x 30.5 [16 x 20 x 2 and 16 x 20 x 12]	Pleated MERV 8 and Cartridge MERV 11
F		Pleated MERV 8 and Cartridge MERV 13
G		Pleated MERV 8 and Cartridge MERV 14

Table 35 - V3 Series B Cabinet Final Filters

Feature 6C	(Quantity) Size	Type
0	No Final Filters	
H	(1) 61 x 61 x 10.2 [24 x 24 x 4]	Pleated, MERV 8
J		Pleated, MERV 11
K		Pleated, MERV 13
L		Pleated, MERV 14

Table 36 - H3 Series C Cabinet Final Filters

Feature 6C	(Qty.) Size (cm) [in.]	Type
0	No Final Filters	
A	(2) 20” x 20” x 2” and (1) 16” x 20” x 2"	Pleated, MERV 8
B	(2) 20” x 20” x12” and (1) 16” x 20” x 12"	Cartridge, MERV 11
C		Cartridge, MERV 13
D		Cartridge, MERV 14
E	(2) 20” x 20” x 2” (1) 16” x 20” x 2" and (2) 20” x 20” x12” (1) 16” x 20” x 12"	Pleated, MERV 8 and Cartridge, MERV 11
F		Pleated, MERV 8 and Cartridge, MERV 13
G		Pleated, MERV 8 and Cartridge, MERV 14

Table 37 - V3 Series C Cabinet Final Filters

Feature 6C	(Qty.) Size (cm) [in.]	Type
0	No Final Filters	
H	(2) 50.8 x 63.5 x 10.2 [20 x 25 x 4]	Pleated, MERV 8
J		Pleated, MERV 11
K		Pleated, MERV 13
L		Pleated, MERV 14

Table 38 - H3 Series D Cabinet Final Filters

Feature 6C	(Qty.) Size (cm) [in.]	Type
0	No Final Filters	
A	(4) 50.8 x 50.8 x 5.1 [20 x 20 x 2]	Pleated MERV 8
B	(4) 50.8 x 50.8 x 30.5 [20 x 20 x 12]	Cartridge MERV 11
C		Cartridge MERV 13
D		Cartridge MERV 14
E	(4) 50.8 x 50.8 x 5.1 and (4) 50.8 x 50.8 x 30.5 [20 x 20 x 2 and 20 x 20 x 12]	Pleated MERV 8 and Cartridge MERV 11
F		Pleated MERV 8 and Cartridge MERV 13
G		Pleated MERV 8 and Cartridge MERV 14

Table 39 - H3 Series E Cabinet Final Filters

Feature 6C	(Qty.) Size (cm) [in.]	Type
0	No Final Filters	
A	(6) 40.6 x 63.5 x 5.1 [16 x 25 x 2]	Pleated MERV 8
B	(6) 40.6 x 63.5 x 30.5 [16 x 25 x 12]	Cartridge MERV 11
C		Cartridge MERV 13
D		Cartridge MERV 14
E	(6) 40.6 x 63.5 x 5.1 and (6) 40.6 x 63.5 x 30.5 [16 x 25 x 2 and 16 x 25 x 12]	Pleated MERV 8 and Cartridge MERV 11
F		Pleated MERV 8 and Cartridge MERV 13
G		Pleated MERV 8 and Cartridge MERV 14

Table 40 - H3/V3 Series Chilled Water, Hot Water, and Steam Coil Sweat Connection Sizes

H3/V3 Series Model	Chilled Water Coil Sweat Connection Size OD (cm, inches)	Hot Water Coil Sweat Connection Size OD (cm, inches)	Steam Coil Sweat Connection Size OD (cm, inches)
A	2.9 (1 1/8)	2.2 (7/8)	6.7 (2 1/8)
B	3.5 (1 3/8)	2.9 (1 1/8)	6.7 (2 1/8)
C	4.1 (1 5/8)	3.5 (1 3/8)	6.7 (2 1/8)
D	6.7 (2 1/8)	4.1 (1 5/8)	6.7 (2 1/8)
E	6.7 (2 1/8)	4.1 (1 5/8)	6.7 (2 1/8)

Controls
Control Options

Terminal Block

Low voltage terminal block for field wiring unit controls

Required Features
Feature 1D - Field Installed Controls by Others

Standard Terminals Labels
[R] - 24VAC control voltage
[C] - Common
[G] - Fan enable
[GC] - Fan EBM Common
[GS] - Fan EBM 0-10VDC – remove jumper for 0-10VDC operation
[9] - Fan EBM Jumper for potentiometer control (connected to GS)
[RA] - EBM RSA Communication
[RB] - EBM RSB Communication
[PF] - Proof of Air Flow

Figure 28 - Example Low Voltage Terminal Block

[O] - Reversing valve cool enable
[HW] - Heat wheel enable

[Y1], [Y2], [Y3], [Y4] - Cooling stage enables
[W1], [W2], [W3], [W4] - Heating stage enables
[WS] - SCR Signal 0-10 VDC
[WC] - SCR Signal Common

[RH] - Humidistat or dehumidification enable input control terminal, used to activate hot gas reheat option
[EC] - 2 position actuator, 24V
OR DDC actuator control signal, 4-20mA. Remove resistor for 0-10VDC operation
[CF] - Clogged filter switch contacts

[P5] - Discharge or suction pressure Common
[P6] - Discharge or suction pressure Signal, 0-5VDC

[CS] - Variable capacity compressor 1-5 VDC
[CC] - Variable capacity compressor common

[BI1], [BI2] – Remote safety shutdown

Variable Air Volume (VAV) Unit Controller

Operation - Variable Air Volume Cooling and Constant Volume Heating
Standard AAON VAV controls for standard and heat pump systems. During the cooling mode of operation the supply fan modulates based on the supply air duct static pressure and cooling modulates based on the supply air temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature.

Factory provided ECM driven motors are used to vary the speed of the supply fans and thus vary the amount of supply air. Because of the reduced speed, VAV units can be very energy efficient at part load conditions. VAV units can be used to serve multiple spaces with diverse or changing heating and cooling requirements, with only a single unit being required for multiple zones. Space temperature sensor included with controller is used for supply air temperature setpoint reset and unoccupied override.

See Control Vendors section for VCCX2 and AAON Touchscreen Controller specifics.

Required Features
Feature 1D - VCCX2 Orion Controls System or AAON Touchscreen Controller
Feature 2 - Hot Gas Bypass Lead Stage - Required on units without variable capacity scroll compressors.
Feature 3 - VAV Unit Controller

Standard Supplied Sensors
Outside Air Temperature - Field Installed
Supply Air Duct Temperature - Field Installed
Supply Air Duct Static Pressure - Field Installed
Return Air Temperature
Space Temperature with Temperature Setpoint Reset and Unoccupied Override - Field Installed

Recommended Features
Model Option B3 - Modulating/SCR Electric Heat
Feature 2 - Modulating Hot Gas Reheat
Feature 5A and 5B - Mixing Box
Feature 5C - Fully Modulating Actuators

Constant Volume (CAV) Unit Controller

Operation - Constant Volume Cooling and Constant Volume Heating
Standard AAON Constant Volume controls for standard systems. During the cooling mode of operation the supply fan provides constant airflow and mechanical cooling modulates based on the controlling temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature.

A Constant Volume unit can be used to serve spaces with uniform heating and cooling requirements. Multiple units may be required for multiple zones. Space or supply air temperature sensor can be used as the controlling sensor. If supply air temperature is not used as the controlling sensor it is used as a temperature lockout. If supply air temperature sensor is used as the controlling sensor, space temperature sensor is used for supply air temperature setpoint reset and unoccupied override.

See Control Vendors section for VCCX2 and AAON Touchscreen Controller specifics.

Required Features
Feature 1D - VCCX2 Orion Controls System or AAON Touchscreen Controller
Feature 3 - Constant Volume Unit Controller

Standard Supplied Sensors
Outside Air Temperature - Field Installed
Supply Air Duct Temperature - Field Installed
Space Temperature with Temperature Setpoint Reset and Unoccupied Override - Field Installed

Recommended Features
Model Option B3 - Modulating/SCR Electric Heat
Feature 2 - Modulating Hot Gas Reheat
Feature 5A and 5B - Mixing Box
Feature 5C - Fully Modulating Actuators

Makeup Air (MUA) Unit Controller

Operation - Constant Volume Cooling and Constant Volume Heating
Standard AAON Makeup Air controls for standard systems. During the cooling mode of operation the supply fan provides constant airflow and mechanical cooling modulates based on the controlling temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature.

Makeup Air units are designed to provide 100% outside air to the system for ventilation purposes. Makeup Air units can improve indoor air quality (IAQ) and also be used to positively pressurize to the space.

See Control Vendors section for VCCX2 and AAON Touchscreen Controller specifics.

Required Features
Feature 1D - VCCX2 Orion Controls System or AAON Touchscreen Controller
Feature 2 - Hot Gas Bypass Lead Stage - Required on units without variable capacity scroll compressors.
Feature 3 - Make Up Air Unit Controller

Standard Supplied Sensors
Outside Air Temperature - Field Installed
Supply Air Temperature - Field Installed

Recommended Features
Model Option B3 - Modulating/SCR Electric Heat
Feature 2 - Modulating Hot Gas Reheat
Feature 13 - Energy Recovery Wheel

Single Zone Variable Air Volume (Single Zone VAV) Unit Controller

Operation - Variable Air Volume Cooling and Constant Volume or Variable Air Volume Heating

Standard AAON Single Zone VAV controls for standard and heat pump systems. During the cooling mode of operation the supply fan modulates based on the space temperature and cooling modulates based on the supply air temperature. For constant volume heating, during the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature. For variable air volume heating, the supply fan modulates based on the space temperature and heating modulates based on the supply air temperature.

Factory provided ECM driven motors are used to vary the speed of the supply fans and vary the amount of supply air. Because of the reduced speed, single zone VAV units can be very energy efficient at part load conditions. Single zone VAV units can be used to serve a single space or multiple zones with uniform heating and cooling requirements. Space temperature sensor included with controller is used for supply air temperature setpoint reset and unoccupied override.

See Control Vendors section for VCCX2 and AAON Touchscreen Controller specifics.

Required Features

Feature 1D - VCCX2 Orion Controls System or AAON Touchscreen Controller
Feature 2 - Hot Gas Bypass Lead Stage - Required on units without variable capacity scroll compressors
Feature 3 - VAV Unit Controller
Feature 5C - Fully Modulating Actuators

Standard Supplied Sensors

Outside Air Temperature Sensor - Field Installed
Supply Air Duct Temperature - Field Installed
Return Air Temperature
Space Temperature with Temperature Setpoint Reset and Unoccupied Override - Field Installed

Recommended Features

Model Option B3 - Modulating/SCR Electric Heat
Feature 2 - Modulating Hot Gas Reheat
Feature 5A and 5B - Mixing Box

AAON Controls

VCCX2 Orion™ Controls System

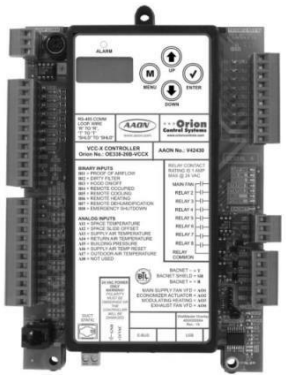


Figure 29 - VCCX2 Controller

The VCCX2 unit controller can be factory provided and factory installed in the AAON air handling unit while the Refrigerant System Module (RSM) board is factory installed in the matching AAON condensing unit. Combined, the boards provide advanced control features, without complexity, in an easy to install and setup package. The VCCX2 controllers can be individually configured, including setpoint adjustment, sensor status viewing, and occupancy scheduling. It can control Single Zone VAV, VAV with optional morning warm-up or supply air tempering, CAV with hood/on operation, MUA, and Space Temperature Control of High Percentage Outdoor Air. Additional features and options can be managed by the controller with the addition of modular expansion I/O boards for the controller. Space temperature sensor included with controller is used for supply air temperature setpoint reset and unoccupied override.

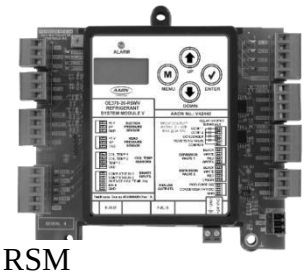


Figure 30 - RSM Board

The VCCX2 controller can be operated as a Stand Alone System, connected via modular cable to multiple VCCX2 controllers in an Interconnected System, or connected via modular cable to multiple VCCX2 controllers, VAV/Zone controllers, and Add-On controllers in a Networked System.

The VCCX2 controller has on-board BACnet® port for connection to an MS/TP network. LON is available with a field provided PT-Link.

Required Operator Interfaces

To configure the VCCX2 controller, an operator interface is needed. Available operator interfaces are the Modular Service Tool SD, Modular System Manager SD, System Manager TS-L, and a PC equipped with free Microsoft Windows® based Prism2 software connected via a CommLink 5. With optional USB-Link2, remote connectivity to the controller via Prism2 software can be accomplished.

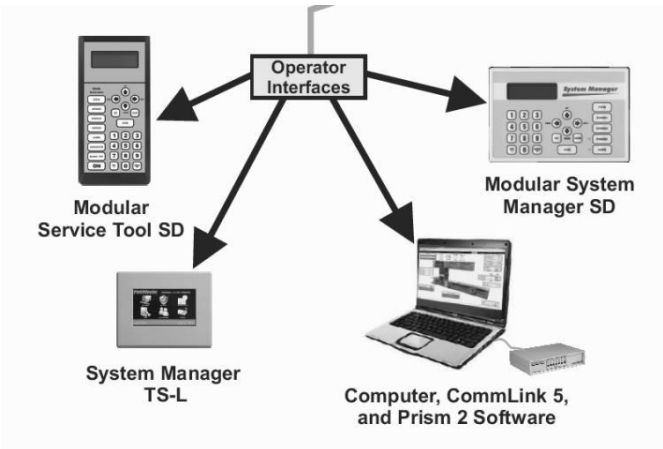


Figure 31 - VCCX2 Controller Operator Interfaces

AAON Touchscreen Controller

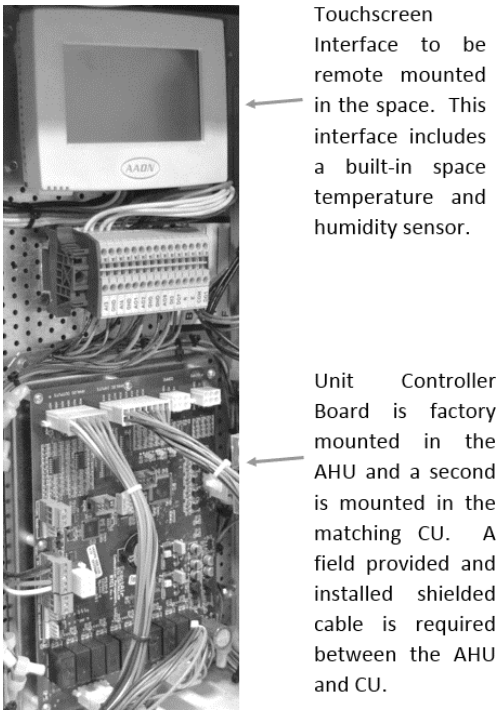


Figure 32 – AAON Touchscreen Controller

The AAON Touchscreen Controller is a simple controls option for energy saving applications. The Unit Controller Board mounts in the AHU. The Touchscreen Interface is to be remote mounted in the space similar to a conventional thermostat.

Controllable Features
A lead/single variable capacity scroll compressor (with up to two total compressor stages), air conditioner or heat pump configuration, ECM driven controlled variable speed supply fan, sensible or enthalpy controlled economizer and modulating SCR electric heating are controllable with the AAON Touchscreen Controller. Modulating hot gas reheat is available with a space temperature sensor and space relative humidity sensor version of the controller. Push button override, alarms and trend logging are available directly from the controller.

Applications
The controller can be used for CAV air conditioner and heat pump applications, single zone VAV air conditioner and heat pump applications, VAV air conditioner and heat pump applications, or MUA air conditioner and heat pump applications.

Scheduling
Weekday, weekend, or daily scheduling is available with the AAON Touchscreen Controller.

Networking
The AAON Touchscreen Controller can be directly connected to a BACnet® MSTP or Modbus RTU network through an EIA-485 connection. The MAC Address, Baud Rate and Max Master are configurable.

Security
The AAON Touchscreen Controller includes password protected User, Operator and Administrator profiles for configuration, scheduling and setpoint adjustment levels of control.

Interface
The unit application, set points, network configuration, schedule, alarms, security, and manual system tests can be managed through the touchscreen interface.

Figure 33 – Touchscreen Interface Screen

Electrical Service Sizing Data

Use the following equations to size the electrical service wiring and disconnect switch for the unit. Electrical data for a specific unit configuration can be found with the AAON ECat software. For further assistance in determining the electrical ratings, contact the Applications Department, or consult U.L. 1995/ U.L. 60335-2-40.

The Minimum Circuit Ampacity (MCA) and Maximum Overcurrent Protection (MOP) must be calculated for all modes of operation which include the cooling mode of operation, the heating mode of operation, and if the unit is a heat pump the emergency heating mode of operation and auxiliary heating mode of operation. The emergency or backup heating mode of operation is when the secondary heater is in operation and heat pump or compressor heating is not in operation. The auxiliary or supplemental heating mode of operation is when heat pump or compressor heating is in operation and the secondary heater is also in operation.

To calculate the MCA and MOP, the number of motors and other current drawing devices in operation must be known for each mode of operation. The largest MCA and MOP values calculated from all the modes operation are the correct values and are also on the unit nameplate.

For example, during the heating mode of operation of an air-cooled DX unit or an air-source heat pump the supply fans, compressors, and condenser fans are all in operation. During the heating mode of operation of an air-cooled DX unit or the emergency heating mode of operation of an air-source heat pump only the supply fans and heater are in operation. During the auxiliary heating mode of operation of an air-source heat pump the supply fans, compressors, condenser fans, and secondary heater are all in operation. In split systems, the MCA and MOP are calculated separately for each unit. In the last example, the supply fans and secondary heater will be used to calculate MCA and MOP values for the air handling unit and the condenser fans and compressor will be used to calculate the MCA and MOP values for the condensing unit.

Once it is determined what current drawing devices are operating during each mode of operation use the equations shown below to calculate the MCA and MOP.

Use Rated Load Amps (RLA) for compressors and Full Load Amps (FLA) for all other motors and electric heaters. Exhaust fan motor current should only be added to the calculations if the unit is 10 tons and smaller, includes a two position actuator (Feature 5C = A), has no compressors, includes an energy recovery wheel and/or when DDC controls by others factory or field installed is ordered.

Load 1 = Current of the largest motor/compressor in operation
Load 2 = Sum of the currents of the remaining motors/compressors in operation
Load 3 = Current of electric heaters in operation
Load 4 = Any remaining loads greater than or equal to 1 amp

Electrical Service Sizing Data Continued

Electric Heat FLA Calculation

Single Phase

$$FLA = \frac{(Heating\ Element kW)\ x1000}{Rated Voltage}$$

Three Phase

$$FLA = \frac{(Heating\ Element kW)\ x1000}{(Rated Voltage)\ x\ \sqrt{3}}$$

Cooling Mode Equations

MCA = 1.25(Load 1) + Load 2 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 4

Heating Mode or Emergency/Backup Heating Mode without Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 4

Heating Mode or Emergency/Backup Heating Mode with Less than 50 kW of Electric Heat Equations

MCA = 1.25(Load 1 + Load 2 + Load 3 + Load 4)
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Heating Mode or Emergency/Backup Heating Mode with Greater than or Equal to 50 kW of Electric Heat Equations

MCA = 1.25(Load 1 + Load 2) + Load 3 + 1.25(Load 4)
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Auxiliary/Supplemental Heating Mode without Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 4

Auxiliary/Supplemental Heating Mode with Less than 50 kW of Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + 1.25(Load 3) + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Auxiliary/Supplemental Heating Mode with Greater than or Equal to 50 kW of Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + Load 3 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Electrical Service Sizing Data Continued

Fuse Selection

Select a fuse rating equal to the MOP value. If the MOP does not equal a standard fuse rating select the next lower standard fuse rating. If the MOP is less than the MCA then select the fuse rating equal to or greater than the MCA.

The standard ampere ratings for fuses, from the *NEC Handbook, 240-6*, shall be considered 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800 and 1000 amperes.

Disconnect (Power) Switch Size

DSS $\geq$ MOP

Select the standard switch size equal to the calculated MOP value. If this value is not a standard size, select the next larger size.

Literature Change History

July 2010
First Revision, Rev. A, of the H3/V3 Engineering Catalog.

April 2012
Update to the catalog changing the 2" pleated 30% efficient filter from MERV 7 to MERV 8, adding additional modulating hot gas reheat options to Feature 2, and adding the Water Coil Connection Sizes table.

July 2012
Update to the catalog showing single serpentine as the only circuitry option for steam heating, and that the steam heating coil option is stream distributing (Model Option B1 = 4), and adding Single Zone VAV and AAON Mini Controller information.

July 2013
Updated Features 2, 16, 20, and 21, updated filter information, updated heating coil information, and updated to design revision B for V3 and H3.

September 2013
Updated crating feature text, coil leak testing verbiage, and hot gas bypass language.

July 2014
Added maximum steam operating pressure, added modulating electric preheat, added the AAON JENEsys control system, and updated water coil connection sizes.

August 2014
Updated return air smoke detector section and added 14 fpi option on cooling coil feature.

July 2015
Feature 1D updated to include Option D: Field Installed Controls by Others + Isolation Relays. Removed Non-Direct Drive Supply Fans.

October 2016
Added Features 13, 17, and 19 Energy Recovery Wheel options to the V3 units. Updated Model Options A1, A2, A3, and B1 by adding more descriptions about the coils. Updated Model Option B3 by redefining the modulating/SCR electric heat. Updated Features 1A, 1B, and 1C by removing all non-ECM fan. Updated Feature 1D descriptions. Updated Feature 2 by adding options R, S, T, and U. Updated Feature 4 by adding options H = Remote Safety Shutdown Terminals and J = Energy Recovery Wheel Rotation Detection. Added tables to show mixing box arrangements. Updated Feature 8 by adding option B copper finned coils. Updated Features 14A and 14B by removing GPM options. Updated Feature 15 with internal control panel information. Updated Feature 16 by adding several more shipping split options. Updated Feature 21 by removing the pulley options since ECMs do not use pulleys. Removed Jenesys controls section.

Literature Change History – Continued

November 2016
Updated Feature 13 description to include the OA filters. Updated Feature 20 Crating to include pictures & clarification.

December 2016
Added a drawing in Feature 13 to show the location of OA filters and Unit filters and to point out that return air filters are not provided on energy recovery units.

June 2017
Updated the wording for Interior Corrosion Protection. Added gas heat features to Model Options B1, B2, and B3. Added options to feature 17 Energy Recovery Cabinet for H3 energy recovery.

June 2018
Added high efficiency gas heat options in Options B2 and B3 for sizes V3- A through C. Added 8fpi and 10 fpi options for hot water and steam coils in Feature B3 (K, L, M, N, P, R). Added option A (0.5kW motor) to Feature 1C. Removed options A, B, and D and added options E (VCCX2 Controller) and H (AAON Touchscreen Controller) to Feature 1D. Removed options B, D, F from Special Controls Feature 3 (CAV, VAV, MUA with Reheat). Added options D, F, G (magnehelic gauge & clogged filter switch for ERV filters) to Feature 7. Added options J, L, N, Q (Aluminum energy recovery wheel) to feature 13 for V3 units. Removed electric preheat from Feature 18. Removed AAON Mini Controller.

September 2018
Updated filter tables for ERW units.

May 2019
Added 5 = Electric Heat (UL 60335-2-40 Compliant) in Model Option B1 for sizes V3-A through C and the corresponding new heating capacities in Model Option B2 (N, P, Q, R, S,T, U, V, W). Added D = Removable Internal Control Panel Option in Feature 15. Changed the combustion air intake for the V3 Series high efficiency gas heater. Added minimum allowable entering air temperature and warranty to gas heater option B3. Clarified orientation for the mixing box return air and outside air damper positions. Added mixing box actuator figure. Updated the e-coating salt spray test value to 10,000 hours.

December 2019
Added stainless steel coil casing options to Feature 8. Included note about coils factory charged with nitrogen holding charge. Updated Energy Recovery Wheel maximum CFM. Added H3 D and E Energy Recovery Wheel side view.

Literature Change History – Continued

December 2022
Revised the interior corrosion protection description. Added hot water in the reheat position under Model Option B1. Added piezo ring option under Feature 1A for EC motors. Added permanent magnet AC TEFC motor with VFD option under Feature 1A. Added several blower model options under Feature 1B. Added hp options under Feature 1C. Updated the terminal block image under Feature 1D. Added Enthalpy Limit and Sensible Limit options under Feature 5C. Revised the H3-E front-front mixing box. Added 4" pleated final filter options under Feature 6C. Added clarification under Feature 12. Added 10kAIC electric option under Feature 14B. Changed small control panel dimensions under Feature 15. Added clarification under Feature 16. Added piezo ring option under Feature 19. Added the high condensate level switch option under Feature 21. Added the A-D options under Feature 22 for additional years of parts only warranty.

June 2023
Removed gas heat information. Adjusted features for UL 60335 compliance. Added option 5 and 6 under Feature B3.

November 2023
Removed Touchscreen controller Feature 1D. Added Gas heat options back in. Options only available for H3 B, C, and D cabinet. Updated electrical kW data in the Heating Tables.

AAON
203 Gum Springs Road
Longview, TX 75602-1721
Phone: 903-236-4403
Fax: 903-236-4463
www.AAON.com

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